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Hearing Date: November 30, 2006, 10:00 am

Counsel to Cadence Innovation LLC

**UNITED STATES BANKRUPTCY COURT
SOUTHERN DISTRICT OF NEW YORK**

-----X	
	:
In re:	: Chapter 11
	:
DELPHI CORPORATION, <i>et. al.</i> ,	: Case No. 05-44481 (RDD)
	:
Debtors.	: Jointly Administered
-----X	

**RESPONSE OF CADENCE INNOVATION LLC TO
DEBTORS' THIRD OMNIBUS OBJECTION TO CLAIMS**

COMES NOW Cadence Innovation LLC ("Cadence"), as successor in interest to Patent Holding Company ("PHC"), and hereby files this response (the "Response")¹ to the Delphi Corporation, *et. al.*'s² Third Omnibus Objection to Claims (the "Objection")

¹ Nothing herein or otherwise, including, but without limitation, any later appearance, pleading, claim, or action, is intended or shall be deemed to be a waiver, release, or modification by Cadence of its (a) right to have final orders in noncore matters entered after *de novo* review by a District Judge; (b) right to trial by jury in any proceeding so triable in this case or any case, controversy, or proceeding related to these cases; (c) right to have the District Court withdraw the reference in any matter subject to mandatory or discretionary withdrawal; or (d) other rights, remedies, claims, actions, defenses, setoffs, or recoupments to which Cadence and/or PHC are or may be entitled, all of which are hereby expressly reserved. Cadence further reserves its right to (i) amend or replace this claim as is appropriate, (ii) assert an administrative expense priority claim with respect to its claim for damages arising out of the Debtors' postpetition infringement of the referenced patents, (iii) file a motion for relief from the automatic stay to allow Cadence to proceed with the Action (as defined below) and enforce any judgment rendered, and (iv) seek withdrawal of the reference with respect to any and all claims that Cadence, may bring against the Debtors.

² The Debtors include: Delphi NY Holding Corporation; Delphi Corporation; ASEC Manufacturing General Partnership; Delphi Medical Systems Colorado Corporation; Delphi China LLC, ASEC Sales General Partnership; Delphi Medical Systems Texas Corporation; Delphi Automotive Systems Overseas Corporation; Delphi Automotive Systems Korea, Inc.; Delphi Automotive Systems International, Inc.; Delphi International Holdings Corp.; Aspire, Inc.; Delphi Connection Systems; Delphi International Services, Inc.; Environmental Catalysts, LLC; Specialty Electronics International, LTD; Delphi Automotive Systems Thailand, Inc.; Delco Electronic Overseas Corporation; Delphi Technologies, Inc.;

[Docket No. 5452], in which they seek to disallow and expunge proofs of claims 10111 and 10100 (collectively, the "Cadence Claims") filed by Cadence against the Delphi Automotive Systems LLC and Delphi Corporation respectively (collectively, the "Debtors"), as unsubstantiated claims. In support of this Response, Cadence shows the Court as follows:

I. PRELIMINARY STATEMENT

1. The Objection should be overruled as to the Cadence Claims because it does not overcome the presumption that timely-filed claims are allowed. In fact, there is significant evidence attached to the proof of claim that establishes that Cadence, as successor in interest to PHC, is presently in possession of unliquidated and disputed claims against the Debtors and their estates.³ In addition, Schedule F of the Debtors' schedules acknowledges the existence of the Cadence Claims. The Objection does not rebut the presumption of allowability of the Cadence Claims because its does not adduce any evidence to support the legal arguments made in the Objection, nor does it properly respond to Cadence's assertions in the Cadence Claims. As such, the Objection should be overruled.

Delphi Automotive Systems (Holding), Inc.; Exhaust Systems Corporation; Delphi Medical Systems Corporation; Delphi Diesel Systems Corp.; Delphi Integrated Service Solutions, Inc.; Packard Hughes Interconnect Company; Delphi Electronics (Holding) LLC; Delphi Mechatronic Systems, Inc.; Specialty Electronics, Inc.; Delphi Automotive Systems Tennessee, Inc.; Delphi LLC; Dreal, Inc.; Delphi Automotive Systems Risk Management Corp.; Delphi Automotive Systems Services LLC; Delphi Liquidation Holding Company; Delphi Foreign Sales Corporation; Delphi Services Holding Corporation; Delphi Automotive Systems Human Resources LLC; Delphi Automotive Systems Global (Holding) Inc.; Delphi Automotive Systems LLC; Furukawa Wiring Systems LLC; Delphi-Receiveables LLC; and MobileAria, Inc.

³ Concurrently herewith, Cadence has submitted its request for relief from the automatic stay so that its claim against the Debtors may be liquidated in the District Court. In addition, Cadence has also contemporaneously filed a motion for the allowance and payment of an administrative expense claim in respect of the damages accruing post-petition by virtue of the Debtors' continuing infringement on all of Cadence's patents. As set forth therein, the liquidation of that claim should be undertaken by the District Court as well, in the interest of judicial efficiency and economy and the avoidance of inconsistent results.

II. FACTS

2. On December 15, 1999, Cadence's predecessor in interest, PHC, commenced an action (the "Action") against Delphi Automotive Systems Corp. ("Delphi") in the District Court for the Eastern District of Michigan, Southern Division (the "District Court") [Case No. 99-76013] on account of the Debtors' direct and willful infringement⁴ of three patents (the "Patents").⁵

3. In May 2003, the District Court bifurcated the patent infringement (i.e., the "liability") phase from the damages and willfulness (i.e., "damages") phase of the Action, directing that the Action first go forward with respect to paradigm claims of the Patents (the "Paradigm Claims")⁶ and Debtors' six paradigm infringing airbag covers. In bifurcating the damages phase of the Action, the District Court specifically recognized that it was necessary to determine liability – in the liability phase – prior to ascertaining damages.

4. Between April and December 2003, Debtors and PHC briefed and argued their proposed definitions of Paradigm Claim terms that the Debtors disputed. The first hearing on the Paradigm Claim construction, commonly known as a "Markman" hearing, was held on June 30, 2003. On December 5, 2003, the District Court ruled in PHC's favor by selecting PHC's proposed Paradigm Claim definition.

5. On April 5, 2004, a Special Master issued a recommended Paradigm Claim construction with respect to 13 remaining issues, ruling in PHC's favor on 11 of

⁴ Pursuant to that certain Stipulated Order dated August 15, 2001, Delphi stipulated that it had been on notice of its infringement since October 1997.

⁵ Attached hereto as Exhibit A is the exhibit Cadence attached to the Cadence Claims summarizing the Action.

⁶ In designating the paradigm claims, Cadence (by its predecessor in interest) expressly reserved its right to assert infringement and/or additional claims with respect to Debtors' infringement of additional patents.

the 13. Subsequently, the Debtors and PHC participated in an oral Markman hearing with respect to the 13 issues before the District Court. On August 6, 2004, the District Court issued its decision (dated August 2, 2004) adopting the Special Master's recommended Paradigm Claim construction in favor of PHC. Taken together, the Special Master and the District Court ruled in PHC's favor on virtually all of the disputed Paradigm Claim terms.

6. On May 2, 2005, PHC formally assigned the Patents to Cadence.

7. On October 8 and 14, 2006, the Debtors filed voluntary petitions for relief under Chapter 11 of Title 11 of the United States Code (the "Bankruptcy Code").⁷ At the time of the Debtors' bankruptcy filing, the Action was ongoing. In particular, because the parties had not been able to mediate their dispute, the Final Pretrial Order was scheduled to be submitted to the District Court on March 28, 2006.

8. Due to the Debtors' bankruptcy filing and the imposition of Section 362 of the Bankruptcy Code, however, the separate liability phase and damages phase of the Action were stayed. As a result, the automatic stay has precluded Cadence from proceeding with discovery concerning (i) the Debtors' infringing airbag covers; (ii) the Debtors' manufacturing of infringing airbag covers; and (iii) technical information used by the Debtors to manufacture the infringing airbag covers, in addition to the ultimate resolution of the Action.

9. On July 20, 2006, Cadence timely filed the Cadence Claims and Proof of Claim Nos. 10074, 10077, 10078, 10079, 10080, 10081, 10082, 10083, 10084, 10085, 10086, 10087, 10088, 10089, 10090, 10091, 10092, 10093, 10094, 10095, 10096, 10097,

⁷ The Debtors continue to operate their businesses and manage their properties as debtors in possession pursuant to Sections 1107(b) and 1108 of the Bankruptcy Code.

10098, 10099, 10101, 10102, 10103, 10104, 10105, 10106, 10107, 10108, 10109, 10110, 10112, 10113, 10114, 10115, 10116, against certain affiliated debtors and debtors in possession, styled "Cadence, as successor in interest to Patent Holding Company" in respect of the claims asserted in the Action. Cadence filed the Cadence Claims against each and every Delphi debtor to preserve its rights against the actual Debtor or Debtors that engaged in manufacturing products that infringe the Patents.⁸

10. By filing the Cadence Claims, Cadence asserts (i) a general unsecured claim with respect to the Debtors' prepetition infringement of the Patents and (ii) an administrative expense priority claim with respect to the Debtors' postpetition infringement of the Patents. Although these claims are currently unliquidated, Cadence contends that the Cadence Claims, once liquidated, will be in an amount not less than \$21 million on account of the Debtors' prepetition infringement and an unknown amount (well in excess of \$4 million) on account of the Debtors' postpetition infringement. Furthermore, because the Debtors' willfully and deliberately infringed the Patents, Cadence is entitled to an award of treble damages and its reasonable attorneys' fees.⁹ Because the full extent of the Debtors' infringement is not yet known, including the possible award of treble damages and attorneys' fees and, the ultimate value of the patent infringement claim will be determined at trial.

⁸ In the Debtors' Second Omnibus Objection, the Debtors have sought to disallow Proof of Claim Nos. 10074, 10077, 10078, 10079, 10080, 10081, 10082, 10083, 10084, 10085, 10086, 10087, 10088, 10089, 10090, 10091, 10092, 10093, 10094, 10095, 10096, 10097, 10098, 10099, 10101, 10102, 10103, 10104, 10105, 10106, 10107, 10108, 10109, 10110, 10111, 10112, 10113, 10114, 10115, 10116 as duplicative of Proof of Claim No. 10100. In respect of the Second Omnibus Claim, as set forth in the contemporaneously filed response thereto, the duplication argument is simply without merit as the claims are not duplicative of the claims against Delphi Corporation, but rather reflect the fact that Delphi operates numerous subsidiaries and affiliates and, depending on discovery, those affiliates may have separate, independent patent liability.

⁹ As discovery is ongoing in the Action, and expert witnesses have not yet been identified or deposed, Cadence reserves its right to amend, alter or modify its damages theories and the quanta of damages asserted in the Action and in the Cadence Claims. The procedural fortuity of the Debtors' bankruptcy should not alter the due process rights of Cadence nor should this fortuity somehow limit the Debtors' liability for willful infringement.

11. In the Objection, the Debtors seek to disallow the Cadence Claims because “[d]uring the Debtors’ review of the [Cadence Claims], the Debtors determined that [the Cadence Claims] assert liabilities or dollar amounts not owing pursuant to the Debtors’ books and records;” the Debtors provide no further explanation. Objection ¶ 28.

III. RESPONSE

12. The Objection should be overruled to the extent it (i) seeks to disallow and expunge the Cadence Claims and (ii) seeks to impose excessive, onerous, and unreasonable requirements that are not required by the Bankruptcy Code, the Bankruptcy Rules, the Local Bankruptcy Rules, or an order from this Court.

A. The Objection Introduces No Evidence Disputing the Cadence Claims

13. As described above, prior to the Petition Date, Cadence’s predecessor in interest, PHC, commenced the Action against the Debtors seeking an award of damages on account of the Debtors’ direct and willful infringement of the Patents. On December 5, 2003, the District Court ruled in PHC’s favor by selecting PHC’s proposed definition.

14. Due to the commencement of their bankruptcy cases, the Action was stayed by the District Court and, as a result, Cadence has been unable to proceed with either the liability phase or the damages phase of the Action. Accordingly, Cadence filed the Cadence Claims to preserve its rights against the actual Debtor or Debtors that engaged in manufacturing products that infringe the Patents.¹⁰

15. The Objection should be overruled pursuant to basic principles concerning the evidentiary effect of a properly filed proof of claim, such as the Cadence Claims. A proof of claim executed and filed in accordance with the Bankruptcy Rules constitutes

¹⁰ 35 U.S.C. § 271 provides that whoever makes, uses offers to sell, or sells any patented invention or actively induces infringement of a patent shall be liable for infringement.

prima facie evidence of the validity and amount of the claim. Fed. R. Bankr. P. 3007(f); Riverbank, Inc. v. Make Meat Corp. (In re Make Meat Corp.), No. 98 Civ. 4990, 1999 U.S. Dist. LEXIS 3974, at *9 (S.D.N.Y. Mar 31, 1999); In re Mission of Care, Inc., 164 B.R. 877, 879 (Bankr. D. Del. 1994); In re Ross, 162 B.R. 785, 788 (Bankr. N.D. Ill. 1993). The burden of going forward then shifts to the Debtors to produce sufficient evidence to negate the *prima facie* validity of the claim. In re Mission of Care, Inc., 164 B.R. at 879. The Debtors' evidence must have probative force at least equal to that of the proof of claim. The Debtors' characterization of the Cadence Claims is not evidence, and certainly does not have sufficient probative force to rebut the Cadence Claims.

16. In particular, "[u]pon the filing of an objection, the objecting party must produce evidence tending to defeat the claim that is of a probative force equal to that of the creditor's proof of claim." In re Ross, 162 B.R. at 788. Moreover, the burden to prove the validity and amount of the claim only falls upon the claimant after the claim is objected to and the objector introduces evidence supporting its objection. In re After Six, Inc., 177 B.R. 219, 228 (Bankr. E.D. Pa. 1995). "A mere objection by the debtor, therefore, does not end the inquiry. Once the claimant has established its *prima facie* case, the burden of going forward then shifts to the debtor to produce evidence sufficient to negate the *prima facie* validity of the filed claim." Make Meat, 1999 U.S. Dist. LEXIS 3974, at *9. An objector may not rebut the *prima facie* case merely by stating that the amount of the claim is incorrect, they must provide evidence to support the statement. In re White, 168 B.R. 825, 829 (Bankr. D. Conn. 1994). "Unless the . . . objector . . . introduces evidence as to the invalidity of the claim or the excessiveness of its amount, the claimant need offer no further proof of the merits of the claim." 3 Lawrence P. King,

Collier on Bankruptcy, ¶ 502.01, at 502 – 16 (15th ed. 1994). “The law is clear. To prevail, the objector must affirmatively *produce* evidence to counter the creditor’s claim.” Make Meat, 1999 U.S. Dist. LEXIS 3974, *10.

17. To the extent that an objecting party adduces evidence to rebut the *prima facie* validity of a claim, something the Debtors have not done, the burden shifts to the claimant only as to those elements of the claim that the debtor has challenged. In re White, 168 B.R. at 829 (citing Gran v. Internal Revenue Serv. (In re Gran), 964 F.2d 822, 828 (8th Cir. 1992)).

18. At a minimum, to justify granting the Objection with respect to the Cadence Claims, the Debtors must set forth comprehensible legal and factual reasons why the Cadence Claims should not be allowed as filed. In the Objection, the Debtors seek to disallow the Cadence Claims because “[d]uring the Debtors’ review of the [Cadence Claims], the Debtors determined that [the Cadence Claims] assert liabilities or dollar amounts not owing pursuant to the Debtors’ books and records.”

19. The Debtors have failed to show any evidence that controverts the Cadence Claims other than a vague assertion that the amounts owing to Cadence are not represented on their books and records. As a matter of black letter bankruptcy law, mere assertions, such as those set forth in the Objection, cannot overcome the *prima facie* evidentiary presumption of the allowability of the Cadence Claims. Accordingly, the Objection should be overruled.

B. The Objection Unilaterally Imposes Overreaching Requirements

20. The Objection should also be overruled to the extent it seeks to impose excessive, onerous, and unreasonable requirements that are not required by the

Bankruptcy Code, the Bankruptcy Rules, the Local Bankruptcy Rules, or an order from this Court.

21. In the Objection, the Debtors impermissibly seek to unilaterally modify the requirements of the Bankruptcy Code, the Bankruptcy Rules and the Local Bankruptcy Rules by requiring respondents to a claims objection to submit: “all documentation or other evidence of the Claim upon which Claimant will rely in opposing the Third Omnibus Claims Objection to the extent not included with the Proof of Claim previously filed with the Court[.]” Objection ¶ 47(d). Moreover, the Debtors also seek to require the Claimant to state the “amount that the Claimant believes would be the allowable amount of such claim upon liquidation of the claim or occurrence of the contingency...” Objection ¶ 47(e). This, too, alters the burden and is without support in the Rules.¹¹

22. Pursuant to Bankruptcy Rule 3001, “[a] proof of claim is a written statement setting forth a creditor’s claim” and “[a] proof of claim executed and filed in accordance with these rules shall constitute *prima facie* evidence of the validity and amount of the claim.” Fed. R. Bankr. P. 3001(a), (f); Make Meat, 1999 U.S. Dist. LEXIS 3974, at *9; Mission of Care, 164 B.R. at 879; Ross, 162 B.R. at 788. The burden of going forward then shifts to the Debtors to produce sufficient evidence to negate the *prima facie* validity of the claim. Mission of Care, 164 B.R. at 879. “A mere objection

¹¹ Moreover, the Notice of Objection and Motion (defined below) purport to require a disclosure of the name, address and telephone number of the person possessing the ultimate authority to reconcile, settle or otherwise resolve the claim on behalf of Cadence. This is entirely inappropriate in that Cadence is represented by counsel and all communications must be made through counsel under applicable ethical rules. In addition, as discussed below, the Debtors have represented that that the procedures contemplated by the Motion would not apply in respect of the Objection to the Cadence Claims. However, because the parties were unable to prepare written documentation of the stipulation, Cadence submitted an objection to the Motion to preserve its rights. In any event, the procedures contemplated in the Motion and the Notice of the Objection should not apply to this Response or any litigation involving the Cadence Claims.

by the debtor, therefore, does not end the inquiry. Once the claimant has established its *prima facie* case, the burden of going forward then shifts to the debtor to produce evidence sufficient to negate the *prima facie* validity of the filed claim.” Make Meat, 1999 U.S. Dist. LEXIS 3974, at *9.

23. In this case, even though the Objection introduces no evidence that would negate the *prima facie* validity of any claim filed – including the Cadence Claims – the Debtors seek to impose the excessive, onerous, and unreasonable requirements of requiring each responding claimant to submit “all documentation or other evidence.”

24. Although the Debtors have requested authority from the Court to impose these excessive, onerous, and unreasonable response requirements in their Motion for Order Pursuant to 11 U.S.C. § 502(b) and 502(c) and Fed. R. Bankr. P. 2002(m), 3007, 7016, 7026, 9006, 9007 and 9014 Establishing (I) Dates for Hearings Regarding Disallowance or Estimation of Claims and (II) Certain Notices and Procedures Governing Hearings Regarding Disallowance or Estimation of Claims (the “Motion”) [Docket No. 5453], the Motion has not been granted. In addition, the Debtors have represented that that the procedures contemplated by the Motion would not apply in respect of the Objection to the Cadence Claims. However, because the parties were unable to prepare written documentation of the stipulation, Cadence submitted an objection to the Motion to preserve its rights. In any event, the procedures contemplated in the Motion and the Notice of the Objection should not apply to this Response.

CONCLUSION

25. Accordingly, the Objection should be overruled because the Debtors have not met the standard required to rebut the Cadence Claims and relief from the automatic

stay should be granted so that the Action and the ultimate resolution of the Cadence Claims may proceed in the District Court.

WHEREFORE, Cadence requests that this Court overrule the Objection.

Respectfully submitted this 22nd day of November 2006.

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Counsel to Cadence Innovation LLC

Exhibit A

ATTACHMENT

Patent Holding Company ("PHC") hereby files this proof of claim¹ in the Debtors'² Chapter 11 bankruptcy cases.³

On December 15, 1999, PHC commenced an action against Delphi Automotive Systems Corp. ("Delphi") in the District Court for the Eastern District of Michigan, Southern Division (the "District Court") Case No. 99-76013, on account of the Debtors' direct and willful infringement⁴ of three PHC patents (the "Action").⁵ A copy of the Complaint filed in the Action is attached hereto as Exhibit "A." In May 2003 the District Court bifurcated damages and directed that the Action go forward with respect to three paradigm patent claims and six paradigm infringing Debtors airbag covers.⁶

On August 12, 2003, the District Court stayed the Action pending claim construction and a subsequent conference with the District Court to discuss a schedule for the remainder of the Action. Between April and December 2003, Debtors and PHC briefed and argued their proposed definitions of terms that the Debtors disputed. The first hearing on the claim construction, commonly known as a "Markman" hearing, was held on June 30, 2003. On December 5, 2003, the District Court ruled in PHC's favor by selecting PHC's proposed definition. As a result, the District Court found that the Debtors' "two-shot" airbag covers infringed on the PHC patents.

¹ Following the Commencement of the Action, PHC, the named Plaintiff, assigned the three patents at issue to Cadence Innovation LLC ("Cadence"). Due to the filing of the Debtors' bankruptcy cases, and the District Court's decision to stay the Action, Cadence's name has not been substituted for PHC in the Action. Accordingly, Cadence hereby files this proof of claim in the name of PHC against the Debtors.

² The Debtors include: Delphi NY Holding Corporation; Delphi Corporation; ASEC Manufacturing General Partnership; Delphi Medical Systems Colorado Corporation; Delphi China LLC, ASEC Sales General Partnership; Delphi Medical Systems Texas Corporation; Delphi Automotive Systems Overseas Corporation; Delphi Automotive Systems Korea, Inc.; Delphi Automotive Systems International, Inc.; Delphi International Holdings Corp.; Aspire, Inc.; Delphi Connection Systems; Delphi International Services, Inc.; Environmental Catalysts, LLC; Specialty Electronics International, LTD; Delphi Automotive Systems Thailand, Inc.; Delco Electronic Overseas Corporation; Delphi Technologies, Inc.; Delphi Automotive Systems (Holding), Inc.; Exhaust Systems Corporation; Delphi Medical Systems Corporation; Delphi Diesel Systems Corp.; Delphi Integrated Service Solutions, Inc.; Packard Hughes Interconnect Company; Delphi Electronics (Holding) LLC; Delphi Mechatronic Systems, Inc.; Specialty Electronics, Inc.; Delphi Automotive Systems Tennessee, Inc.; Delphi LLC; Dreal, Inc.; Delphi Automotive Systems Risk Management Corp.; Delphi Automotive Systems Services LLC; Delphi Liquidation Holding Company; Delphi Foreign Sales Corporation; Delphi Services Holding Corporation; Delphi Automotive Systems Human Resources LLC; Delphi Automotive Systems Global (Holding) Inc.; Delphi Automotive Systems LLC; Furukawa Wiring Systems LLC; Delphi-Receivables LLC; and MobileAria, Inc.

³ PHC files this proof of claim against each and every Delphi debtor to preserve its rights against the Debtor or Debtors that engaged in manufacturing products that infringe its patents.

⁴ Pursuant to that certain Stipulated Order dated August 15, 2001, Delphi stipulated that it had been on notice of its infringement since October 1997.

⁵ Attached hereto as Exhibit A is a true and correct copy of the Complaint.

⁶ In designating the paradigm claims, PHC expressly reserved its right to assert infringement and/or additional claims with respect to Delphi's infringement of additional PHC patents.

On April 5, 2004, a Special Master issued recommended claim construction with respect to 13 remaining issues, ruling in PHC's favor on 11 of the 13. On July 21, 2004, following the parties' objection to the Special Master's recommended claim construction, the Debtors and PHC participated in an oral Markman hearing with respect to the 13 issues before the District Court. On August 6, 2004, the District Court issued its decision (dated August 2, 2004) adopting the Special Masters recommended claim construction in favor of PHC. Taken together, the Special Master and the District Court ruled in PHC's favor on virtually all of the disputed claim terms.

At the time of the Debtors' bankruptcy filing, the Action was ongoing and the parties were in the midst of mediating their dispute. Due to the bankruptcy filing, the Action was stayed in accordance with Section 362 of the Title 11 of the United States Code (the "Bankruptcy Code").

PHC's claims arise out of the stayed Action. By filing this Proof of Claim, PHC seeks allowance of (i) a general unsecured claim with respect to its claim for damages arising out of the Debtors' prepetition infringement of the PHC patents and (ii) an administrative expense priority claim with respect to its claim for damages arising out of the Debtors' postpetition infringement of the PHC patents. In addition, by filing this proof of claim, PHC seeks to preserve its claim against each Delphi debtor entity that willfully and intentionally infringed the PHC patents. Although this claim is currently disputed by the Debtors and is unliquidated, these claims, once liquidated, will be in an amount not less than \$21 million on account of the Debtors' prepetition infringement and an unknown amount (well in excess of \$4 million) on account of the Debtors' postpetition infringement. In addition, because the Debtors' willfully and deliberately infringed the PHC patents, PHC is entitled to an award of treble damages and its reasonable attorneys' fees. However, because the full extent of the Debtors' infringement is not yet known, including the possible award of treble damages and attorney fees, the ultimate value of the PHC claim will be determined at trial. Accordingly, PHC seeks allowance of the full amount of its general unsecured and administrative expense claims once the same have been reduced to judgment and liquidated.

Nothing herein or otherwise, including, but without limitation, any later appearance, pleading, claim, or action, is intended or shall be deemed to be a waiver, release, or modification by PHC of its (a) right to have final orders in noncore matters entered after de novo review by a District Judge; (b) right to trial by jury in any proceeding so triable in this case or any case, controversy, or proceeding related to these cases; (c) right to have the District Court withdraw the reference in any matter subject to mandatory or discretionary withdrawal; or (d) other rights, remedies, claims, actions, defenses, setoffs, or recoupments to which PHC is or may be entitled, all of which are hereby expressly reserved. PHC further reserves its right to (i) amend or replace this claim as is appropriate and (ii) file a motion for relief from the automatic stay to allow PHC to proceed with the Action and enforce any judgment rendered and (iii) seek withdrawal of the reference with respect to any and all claims that PHC may bring against the Debtors.

EXHIBIT A

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

PATENT HOLDING COMPANY,

Plaintiff,

vs.

HON. GEORGE WOODS
HON. MAGISTRATE JUDGE PEPE

DELPHI AUTOMOTIVE SYSTEMS
CORPORATION,

CIVIL ACTION NO. 99-76013

Defendant.

JURY TRIAL DEMANDED

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SECOND AMENDED COMPLAINT
FOR PATENT INFRINGEMENT AND DEMAND FOR JURY



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I. THE PARTIES

Plaintiff, Patent Holding Company ("PHC"), is a Michigan corporation having an address at 33662 James J. Pompo, Fraser, Michigan 48026.

Defendant, Delphi Automotive Systems Corporation ("Delphi"), is a Delaware corporation having an address at 5725 Delphi Drive, Troy, Michigan 48098-2815.



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II. JURISDICTION AND VENUE

The claims pleaded herein arise under the Patent Act, 35 U.S.C. §100, *et. seq.*, and subject matter jurisdiction for such claims is conferred on the Court by 28 U.S.C. §1338(a).

Venue is proper in this judicial district under 28 U.S.C. §1400(b).



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III. FACTUAL BACKGROUND

A. PHC And The '485 Patent

5. United States Patent No. 5,501,485 ("the '485 patent," **Exhibit A**) was duly and lawfully issued on March 26, 1996, to Thomas L. Eckhout for an invention titled "SNAP-ON AIR BAG COVER."

6. PHC is the owner by assignment of the '485 patent including the right to bring and maintain actions for any past, present or future infringement of such patent in the name and on the behalf of PHC.

B. PHC And The '026 Patent

7. United States Patent No. 5,498,026 ("the '026 patent," **Exhibit B**) was duly and lawfully issued on March 12, 1996, to Thomas L. Eckhout for an invention entitled "AIR BAG COVERING HAVING A HIDDEN BREAK SEAM."

8. PHC is the owner by assignment of the '026 patent including the right to bring and maintain actions for any past, present or future infringement of such patent in the name and on behalf of PHC.

C. PHC And The '031 Switch Patent

9. United States Patent No. Re. 35,031 ("the '031 patent," **Exhibit C**) was duly and lawfully issued on September 5, 1995, as a reissue of U.S. Patent No. 5,062,661 to Larry J. Winget for an invention entitled "AUTOMOTIVE AIR BAG COVER HAVING A HORN SWITCH FORMED THEREIN."

10. PHC is the owner by assignment of the '031 patent including the right



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to bring and maintain actions for any past, present or future infringement of such patent in the name and on behalf of PHC.

D. The Infringing Acts Of Delphi

11. Delphi has directly infringed claims of the '485, '026 and '031 patents by making, using, selling and/or offering for sale, in the United States, certain airbag covers, including but not limited to, at least the following:

- (a) C/K pickup truck series airbag cover models sold under the "GMC" and "Chevrolet" brands;
- (b) Buick Century airbag cover models;
- (c) Park Avenue airbag cover models; and
- (d) Cutlass airbag cover models.

12. Delphi has admitted making, using, selling and/or offering for sale the allegedly infringing airbag models specifically referred to in Paragraph 11. *See, e.g.,* May 15, 2000, Letter (Exhibit D).

13. PHC avers that a reasonable opportunity for further investigation or discovery will likely show that Delphi has directly infringed, contributorily infringed and/or induced the infringement of claims of the '485, '026 and '031 patents with respect to airbag covers, including but not limited to those specifically referred to in Paragraph 11.

14. PHC avers that a reasonable opportunity for further investigation or discovery will likely show that Delphi is liable for infringement of the '485, '026 and '031 patents as a successor to General Motors Corporation ("GM") with respect to the airbag cover or airbag related business and/or in connection with the design, purchase from others, use,



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manufacture, sale and/or importation of airbag covers, including but not limited to those covers specifically referred to in Paragraph 11.

15. Delphi has infringed, or is responsible for the infringement of, the '485, '026 and '031 patents as successor to GM pursuant to the GM-Delphi Technology Transfer Agreement, in that Delphi is to defend any suit or claim against GM arising out of any actual or alleged direct or contributory infringement of, or inducement to infringe, any United States patent by reason of the manufacture, use or sale of products or services purchased by GM or others from Delphi under agreements, projects or ventures entered into prior to January 1, 1999, including those suits and claims involving PHC's '485 and '026 patents.

F. Notice Of Infringement To Delphi

16. Delphi has been provided, both verbally and in writing, with repeated notice of its infringement of the '485, '026 and '031 patents. *See, e.g.*, May 7, 1998, Letter (Exhibit E).

17. Delphi continues to infringe despite having been given notice of infringement, and will continue to do so unless preliminarily and permanently enjoined by this Court.

18. Delphi's infringement has been willful and deliberate.

E. Delphi Is Liable To PHC For Patent Infringement

19. Delphi has directly infringed the '485, '026 and '031 patents under 35 U.S.C. §271, and is liable to PHC for such infringement.

20. PHC avers that a reasonable opportunity for further investigation for discovery will likely show that Delphi has induced infringement of and/or contributory



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infringed the '485, '026 and '031 patents under 35 U.S.C. §271, and is liable to PHC for such infringement.

21. PHC avers that Delphi has infringed, or is responsible for infringement of, the '485, '026 and '031 patents as a successor to GM pursuant to the GM-Delphi Technology Transfer Agreement, and is liable to PHC for such infringement.

22. PHC is entitled to a preliminary and permanent injunction against any further infringement of the '485, '026 and '031 patents by Delphi under at least 35 U.S.C. §283.

23. PHC is entitled to an award of damages adequate to compensate for infringement of the '485, '026 and '031 patents, together with interest and costs as may be fixed by the Court, under at least 35 U.S.C. §284.



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IV. DEMAND FOR RELIEF

WHEREFORE, PHC demands entry of a judgment against Delphi granting the following relief:

- A. An award to PHC adequate to compensate for the patent infringement;
- B. A determination that such patent infringement has been willful and deliberate;
- C. An award of treble damages based on the willful and deliberate infringement;
- D. A determination that this case is "exceptional" under 35 U.S.C. §285, and an award to PHC of its reasonable attorney fees;
- E. An order preliminarily and permanently enjoining Delphi, its officers, agents, servants, employees, and attorneys, and such other persons in active concert or participation with them who receive actual notice of the order, from further infringement of the patents-in-suit; and
- F. Such other and further relief as PHC may be entitled to on the proofs.



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V. DEMAND FOR JURY TRIAL

PHC hereby demands trial by jury for all issues so triable.

Respectfully submitted,

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Dated: August 25, 2000

Attorneys for Patent Holding Company



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CERTIFICATE OF SERVICE

I certify that true and correct copies of the following:

**SECOND AMENDED COMPLAINT FOR
PATENT INFRINGEMENT AND DEMAND FOR JURY;**

-and-

**STIPULATION AND ORDER ALLOWING FILING OF SECOND
AMENDED COMPLAINT, AND FOR WITHDRAWAL OF RULE 11
MOTION**

on August 25, 2000

_____ via facsimile and courier

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EXHIBIT A

United States Patent

Pg 27 of 52

Eckhout

Patent Number: 5,501,485

Date of Patent: Mar. 26, 1996

[54] SNAP-ON AIR BAG COVER

[75] Inventor: Thomas L. Eckhout, Waterford, Mich.

[73] Assignee: Larry J. Winget, Leonard, Mich.

[21] Appl. No.: 479,850

[22] Filed: Jun. 7, 1995

Related U.S. Application Data

[63] Continuation of Ser. No. 140,669, Oct. 31, 1993, abandoned, which is a continuation-in-part of Ser. No. 984,336, Dec. 2, 1992, abandoned.

[51] Int. Cl.⁶ B60R 21/20

[52] U.S. Cl. 280/728.3

[58] Field of Search 280/728.3, 728.2,
280/731, 732, 738.1

[56] References Cited

U.S. PATENT DOCUMENTS

4,325,568	4/1982	Clark et al.	280/731
4,934,735	6/1990	Embach	280/731
5,064,217	11/1991	Shiraki	280/728 B
5,085,462	2/1992	Gualtier	280/731
5,186,490	2/1993	Adams et al.	280/728 B
5,239,147	8/1993	Allard et al.	200/61.54
5,280,946	1/1994	Adams et al.	280/728 B
5,283,404	2/1994	Prescare, Jr.	200/61.54
5,306,040	4/1994	Leonelli et al.	280/728 B
5,314,203	5/1994	Adams et al.	280/728 A

5,323,334	9/1994	Hansen et al.	280/731
5,338,069	3/1994	Soderquist	280/728 B
5,342,686	3/1994	Harris et al.	280/728 B
5,346,249	9/1994	Haitara et al.	280/728 B

FOREIGN PATENT DOCUMENTS

0488618	6/1992	European Pat. Off.	280/728 B
4113591	12/1991	Germany	280/728 B
01-3752	6/1991	Japan	280/731
5139236	6/1993	Japan	280/731 A

Primary Examiner—Margaret A. Focanno

Assistant Examiner—Peter C. English

Attorney, Agent, or Firm—Brooks & Kusman

[57]

ABSTRACT

A snap-on air bag cover for use with an uninflated air bag container including a retaining member, the snap-on air bag cover comprising, a plastic front cover adapted to directly enclose the uninflated air bag container, a pair of plastic side panels connected to opposite sides of the front cover, a resilient clip member extending from each of the side panels, the clip member having an extending snap-on groove defined therein adapted to cooperate with the retaining member for affixing the air bag cover to the air bag container, wherein the pair of side panels are connected to the front cover such that the side panels and resilient clip members are permitted to pivotably travel away from each other in opposite directions allowing the retaining member to enter and abuttingly engage the snap-on groove thereby retaining the air bag cover on the air bag container.

20 Claims, 3 Drawing Sheets

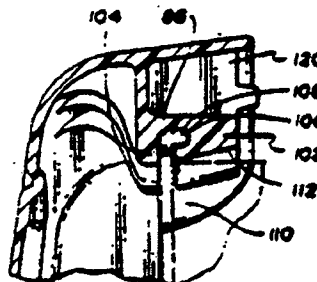
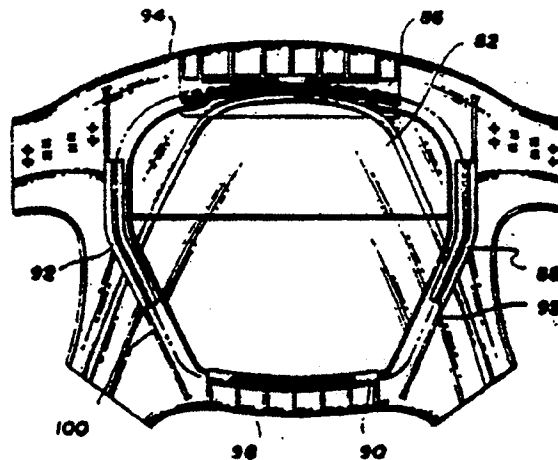


Exhibit A

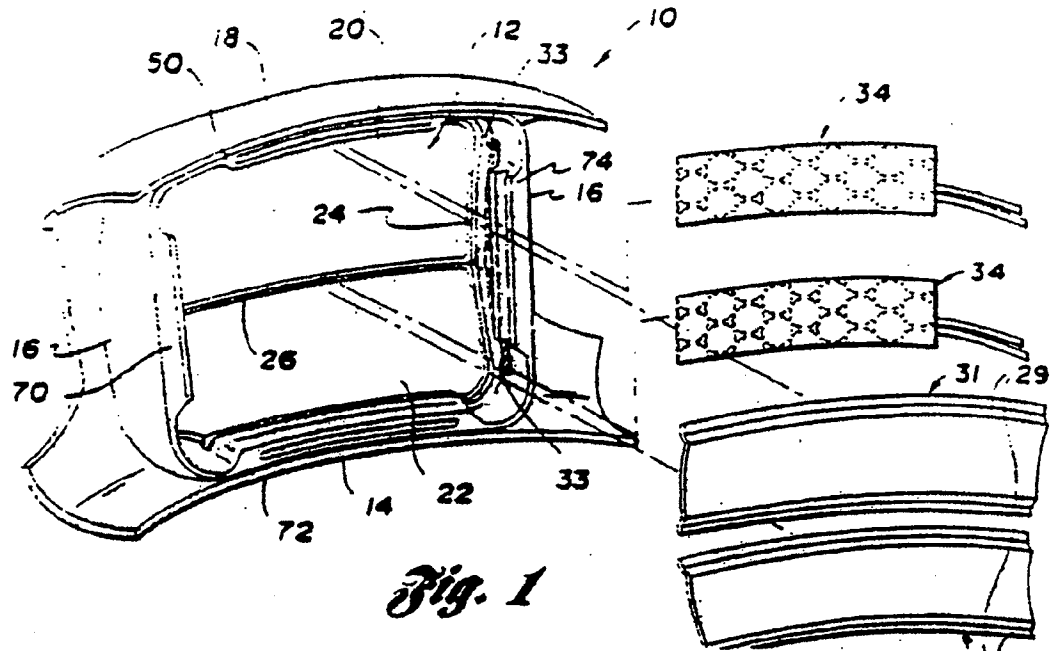


Fig. 1

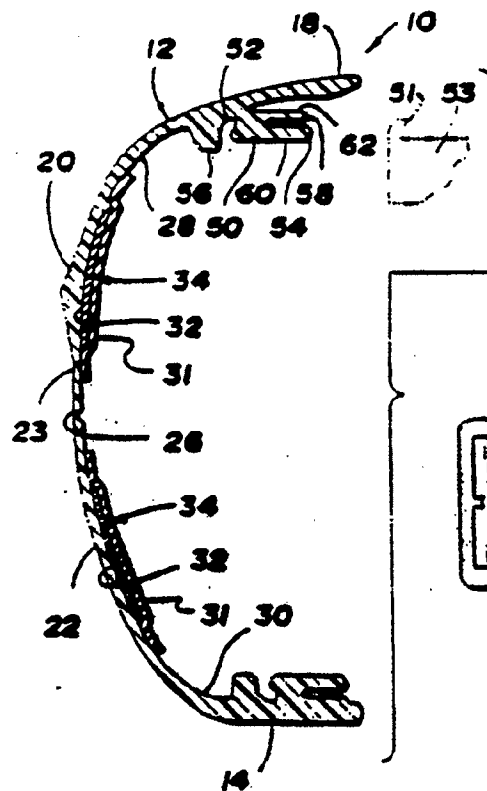


Fig. 2

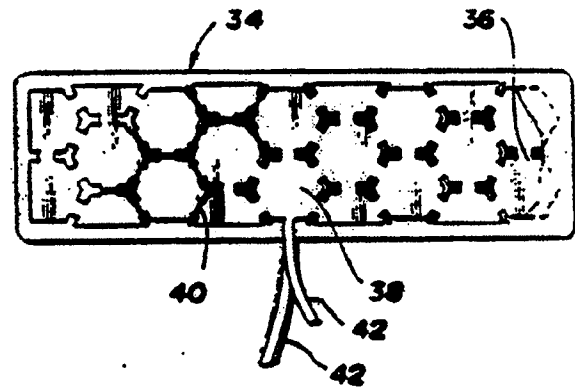


Fig. 3

Fig. 6

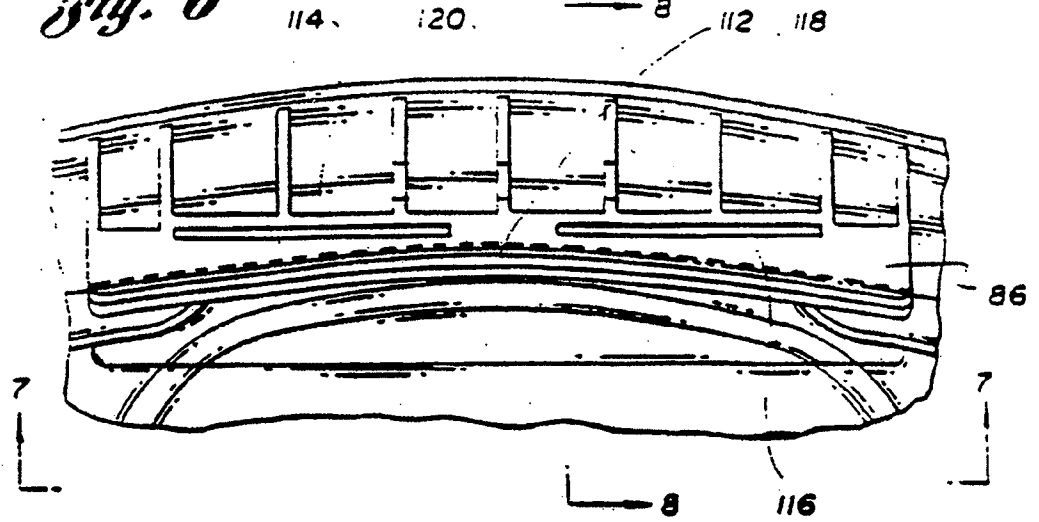


Fig. 7

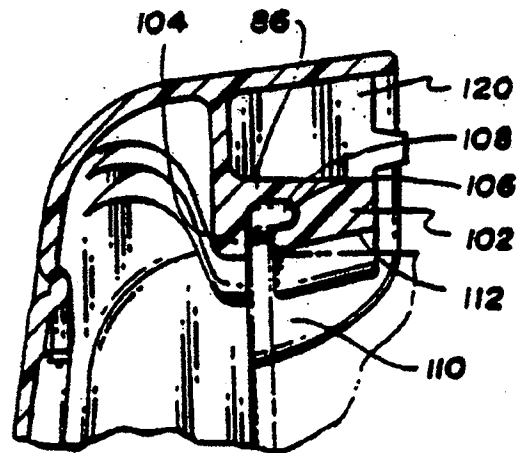
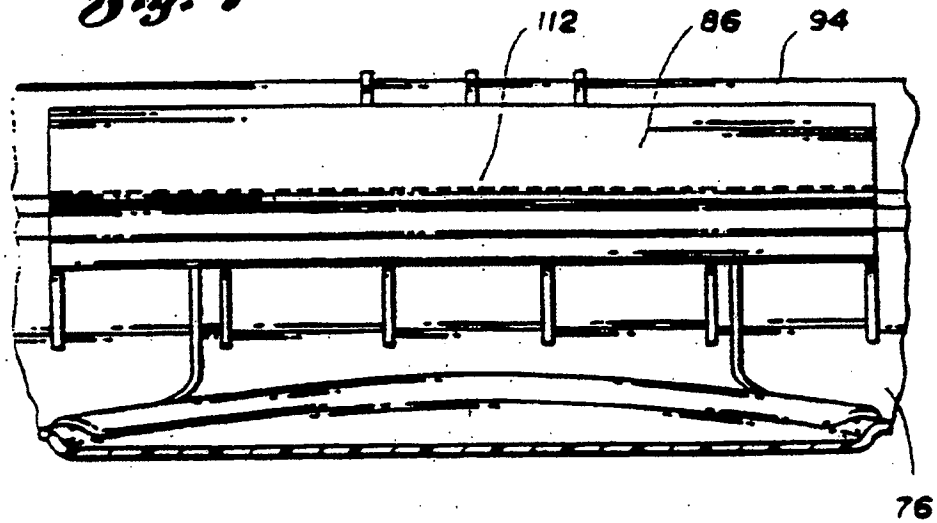


Fig. 8

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SNAP-ON AIR BAG COVER

CROSS-REFERENCE TO RELATED APPLICATIONS

This is a continuation of application(s) Ser. No. 08/140,669 filed on Oct. 21, 1993, abandoned, which is a continuation-in-part application of U.S. patent application Ser. No. 07/984,326, filed Dec. 2, 1992 and entitled "Air Bag Cover Having A Horn Switch Disposed Therein", abandoned. This application is further related to co-pending application Ser. Nos. 08/140,549 and 08/140,768 both filed Oct. 20, 1993 with this application.

TECHNICAL FIELD

This invention relates to plastic air bag covers and in particular to air bag covers which are affixable to uninflated air bag containers.

BACKGROUND ART

Presently, when air bag covers are provided in automobiles on the drivers side of the vehicle, the air bag is stored in the steering column behind an air bag cover. During automatic inflation of the air bag, the air bag cover moves away from the steering column to permit its safety function between the steering column and the operator of the vehicle.

Recent practice in the automotive industry is utilization of all plastic fabricated air bag covers. Conventional air bag covers used in conjunction with occupant restraint systems often include various connection systems for attaching the air bag cover to the uninflated air bag container. As those skilled in the art will recognize, such systems normally include a two piece cover construction wherein a first cover portion, usually manufactured from a relatively stiff material, is initially disposed directly over the uninflated air bag container. A second more resilient cover portion is next affixed over the first cover portion and used as the outer decorative cover.

U.S. Pat. No. 4,325,568 issued to Clark et al. discloses a modular occupant restraint system including an inflator, a cushion, a container for the cushion and an air bag cover for the container assembled as a module. Clark et al. utilizes a two piece air bag cover construction. U.S. Pat. No. 5,085,462 issued to Gaultier discloses an air bag and vehicle horn switch assembly. Gaultier also discloses a conventional two piece cover construction.

U.S. Pat. No. 5,186,490 issued to Adams et al. discloses a cover for a inflatable restraint system for a motor vehicle which contains a slot in the upper wall thereof into which a thin or membrane type switch assembly is inserted. Adams et al. further discloses an air bag cover having an injection molded thermoplastic upper wall and a soft outer cover exposed to the interior of the vehicle manufactured from urethane, vinyl or polyester. The outer cover completely encompasses and overlaps the upper wall structure and uninflated air bag forming two structures the air bag must exit to carry out its function.

DISCLOSURE OF THE INVENTION

The object of the present invention is to provide a one piece, snap-on air bag cover that is affixable directly to an uninflated air bag container.

In carrying out the above object and other objects of the present invention, an automotive air bag cover cover constructed in accordance with the present invention is pro-

vided. The snap-on automotive air bag cover comprises a plastic front cover adapted to directly enclose an uninflated air bag container, a pair of plastic side panels connected to opposite sides of the front cover, a resilient clip member extending from each of the side panels, the clip member having an extending snap-on groove defined therein adapted to cooperate with the retaining member for affixing the air bag cover to the air bag container, wherein the pair of side panels are connected to the front cover such that the side panels and resilient clip members are permitted to pivotally travel away from each other in opposite directions allowing the retaining member to enter and abuttingly engage the snap-on groove thereby retaining the air bag cover on the air bag container.

Preferably the clip member comprises a front engagement section and a rear shoulder section, the front engagement section having an inclined outer surface for cooperating with the retaining member for sliding the air bag cover onto the air bag container, and the snap-on groove is disposed between the front and rear sections.

Also, preferably, the snap-on groove is "L" shaped in cross section, the clip member extends along at least one third the length of said side panel and the snap-on groove extends the entire length of the clip member.

These and other features and additional objects of the invention will occur to those skilled in the art on reading the following description with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded view of an automotive air bag cover, constructed in accordance with the present invention;

FIG. 2 is a sectional view of the assembled air bag cover of FIG. 1;

FIG. 3 is a top plan view, partially broken away, of the horn switch assembly;

FIG. 4 is a front plan view of an alternative embodiment of an automotive air bag cover constructed in accordance of the present invention;

FIG. 5 is a rear plan view of the alternative embodiment of FIG. 4;

FIG. 6 is an enlarged, fragmentary view of the clip connector of the present invention;

FIG. 7 is enlarged, fragmentary view of the clip connector of the present invention looking along the directions of lines 7-7 in FIG. 6; and

FIG. 8 is a cross sectional view of the clip connector of the present invention taken along lines 8-8 of FIG. 6.

BEST MODE FOR CARRYING OUT THE INVENTION

Referring now to the drawing Figures, there is illustrated in FIGS. 1 and 2, a first embodiment of an automotive air bag cover, generally indicated at 10, constructed in accordance with the present invention. Typically, the automotive air bag cover 10 is secured at the top end of a vehicle drive column (not shown) at the steering wheel of the vehicle.

A front cover, generally indicated at 12 of the air bag cover 10, is integrally formed with side panels 14, 16 and 18. Typically, the side panels 14, 16 and 18 are apertured, as illustrated in FIGS. 1 and 2, to permit the cover 10 to be fixedly secured to the vehicle drive column. Outer surface 22 is disposed to face the vehicle operator (not shown).

5,501,485

3

The front and side panels 12, 14, 16, and 18 are adapted to enclose an uninflated automotive air bag (not shown) between the cover 10 and the steering column (not shown).

The front panel 12 includes upper and lower portions 20 and 22, respectively. The upper and lower portions 20 and 22 are interconnected to the side panels 16 at break seams 24 (only one of which is shown in FIG. 1) and to each other at a break seam 26. The break seams 24 and 26 are of reduced thickness, to permit the air bag, as it is inflating, to exert a force at the inner portion of the front panel 12 to cause the upper and lower portions 20 and 22 of the front panel 12 to separate from the side panels 16 along the break seams 24 and to separate from each other along the break seam 26.

The upper portion 20 of the front panel 12 is hingedly connected to the top panel 18 at a hinge 28 and the lower portion 22 of the front panel 12 is hingedly connected to the bottom side panel 14 at a hinge 30, as best shown in FIG. 2. After separation from the side panels 14 and 16, the upper and lower portions 20 and 22 of the front panel 12 can swing upwardly and downwardly, respectively, and out of the way of the inflating air bag.

Rear panels 31 are fixedly secured about their periphery to the upper and lower portions 20 and 22 of the front panel 12 at their inner surfaces to move therewith and to form sealed, hollow compartments 32, as best shown in FIG. 2. Preferably, the rear panels 31 are hot plate welded, heat staked or otherwise attached to the upper and lower portions 20 and 22 at their outer periphery adjacent the break seam 26 between the upper and lower portions 20 and 22, respectively, and adjacent the break seams 24. The rear panels 31 do not cover any of the break seams 24 or 26 since this would hinder or possibly prevent separation along the break seams 24 and 26.

The air bag cover 10 preferably includes a pair of horn switch assemblies, generally indicated at 34. Each assembly 34 extends substantially the entire width of the front panel 12 between the side panels 16 within its respective hollow compartment 32.

As illustrated in FIG. 2, each assembly 34 substantially fills its respective hollow compartment 32. As illustrated in FIG. 3, each horn switch assembly 34 includes a pair of spaced flexible, transparent, plastic layers 36. On the inner surface of one of the plastic layers 36, there is formed a matrix layer 38 of interconnected hexagonal pads which forms an electrically conductive inner surface for making a circuit path with a corresponding second electrically conductive inner surface of another matrix of interconnected hexagonal pads formed on the other plastic layer 36. Upon manual actuation of the corresponding portion of the front panel 12, the circuit path is made.

The circuit path is made through an insulator layer 40 which is disposed between and spaces the layers 38 apart so that electrical connection is only made between the hexagonal pads of the layers 38. The insulator layer 40 insulates the interconnecting portions of the electrically conductive inner surfaces of the layers 38 from one another. The insulator layer 40 is preferably made of foam and has a honeycomb structure.

Preferably, the horn switch assemblies 34 are foil switch assemblies cut to size from a mat of material commercially available from Illinois Tool Works, Inc. of Glenview, Ill. Then, electrically conductive leads 42 which are encapsulated in plastic are electrically connected to certain pads of each of the layers 38 at one end thereof and to the automobile's electrical system at the opposite end through a break-away connection.

4

Referring now to FIG. 1, there is shown a resilient clip connector 50 extending from side panel 18. A snap-on groove 52 is shown disposed within clip connector 50. Clip connector 50 is comprised of a front engagement section 54 and a rear shoulder section 56 with snap-on groove 52 disposed between front engagement section 54 and rear shoulder section 56. Snap-on groove 52 is configured to cooperate with a retaining rim 51 on uninflated air bag container 53 (shown in phantom). For proper connection and retention, the snap-on groove should have a cross-sectional shape that corresponds to the shape of the air bag container rim.

As shown, clip connector 50 also includes a biasing groove 58 which extends in a direction parallel with the snap-on groove 52. The biasing groove 58 divides the front engagement section 54 into a first segment 60 and a second segment 62. The biasing groove 58 allows the first segment 60 to deform and move toward the second segment when the air bag container rim 51 is initially engaged with the clip connector just prior to full engagement within the snap-on groove 52.

Referring now to FIG. 1, there is shown four clip connectors 50, 70, 72, and 74 extending from each side panel. It is contemplated in the preferred embodiment that each clip member extend at least one third of the length of the respective side panel and the snap-on groove 52 extend the entire length of the clip connector 50.

Referring now to FIGS. 4 and 5, there is shown generally, air bag cover 76, an alternative embodiment constructed in accordance with the present invention. The air bag cover 76 includes a front cover 78 having an inner surface 82 and an outer surface 80. The inner and outer surfaces 82 and 80 respectively define a thickness of front cover 78 which is in a range from 2.0 to 6.0 millimeters. The air bag cover 76 is designed to be operably located within the automobile interior (not shown) such that the front cover outer surface 80 is exposed to occupant view.

The air bag cover 76 includes four clip connectors 86, 88, 90 and 92 connected to respective side panels 94, 96, 98, and 100. Referring now to FIG. 8, and using clip connector 86 as representative of the other clip connectors, each clip connector includes a front engagement section 102 and a rear shoulder section 104. As with the prior embodiment, a snap-on groove 106 is defined between the front engagement section 102 and the rear shoulder section 104. The snap-on groove 106 of the second embodiment of the present invention has a cross sectional shape which corresponds to the rim 108 of the air bag container 110. The snap-on groove shown in FIG. 8 is L-shaped to correspond to the outer shape of rim 108. Clip connector 86 further includes an outer inclined surface 112 as shown in FIGS. 7 and 8.

Referring now to FIG. 6, there is shown a biasing groove 114. Biasing groove 114, as with the prior embodiment discussed above, extends parallel to the snap-on groove 106. The biasing groove divides clip connector 86 into a first segment 116 and a second segment 118. As those skilled in the art will recognize, the inclined surface 112 in cooperation with the biasing groove 114 assist in locating and abuttingly engaging the rim 108 of the air bag container 110 within the snap-on groove 106.

More specifically, as the rim 108 of the air bag container 110 initially contacts the clip connector 86, the rim slides along the inclined surface 112 towards the snap-on groove 106. Simultaneously, the first segment 116 of the front engagement section is deformed and moves toward second segment 118. In this fashion, the snap-on connection of the

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5

air bag cover to the air bag container is assisted. For structural integrity and material cost savings it is contemplated that the front engagement portion may include a plurality of spaced apart, parallel supports 120 which are disposed perpendicular to the snap-on groove.

It is preferred that the air bag cover of the present invention be manufactured from a flexible thermoplastic rubber such as commercially available "Santoprene" 201-87 provided by Advance Elastomers Systems of Auburn Hills, Mich. Santoprene is a registered trademark of the Monsanto Company. Santoprene 201-87 is a colorable thermoplastic general purpose elastomer with good fluid resistance which is processable by injection molding and extrusion.

The tear strength, ultimate tensile strength, hardness, and elasticity of the material are characteristic important to the choice of the thermoplastic material used to manufacture the air bag. The preferred thermoplastic material used for manufacture of the air bag cover has a tensile strength in a range from 15.0 to 17.0 Mpa's. The preferred material used has a tear strength in a range from 47 to 51 kN/M at 25 degrees celsius and 21 to 25 kN/M at 100 degrees celsius. The preferred material used has a durometer hardness in a range of 70 to 100 on the Shore A scale. The above characteristics in conjunction with the structure of the air bag cover satisfy the necessary conditions related to the inflation and exit of the air bag from the cover.

Having described the structural characteristics of the present invention, attention is now turned to operation of the snap-on air bag cover. Referring to FIGS. 5-8, each clip connector 86, 88, 90 and 92 extends from a respective side panel 94, 96, 98 and 100. Each clip connector is attached to the respective side panel in a live hinge-like fashion such that the clip connectors and associated side panels move away from the front cover upon operative insertion of the air bag container rim 108 within snap-on groove 106.

For example opposing side panels 96 and 100 move away from front cover 82 and also away from each other as the rim 108 is abuttingly engaged against the inclined surfaces 112 of each clip connector 88 and 92. Further the cooperation of the biasing grooves in the other pair of opposing clip connectors 86 and 90 works to assist in locating and operatively connecting the air bag container 110 to the air bag cover 76.

The particular thermoplastic rubber described above assists in providing the operative resilient characteristics needed to provide an air bag cover which is directly affixable to an air bag container. The air bag cover of the present invention is resilient enough to accept deformation of the side panels and clip connectors while the air bag cover is connected to the air bag container and rigid enough to contain the air bag container on the steering column (not shown) throughout the operative life of the associated vehicle. Thus, the tear strength, ultimate tensile strength, hardness, and elasticity of the thermoplastic rubber material, as described above are important to the overall operation of the air bag cover.

The air bag cover of the present invention is preferably injection molded using conventional injection molding techniques. The preferred embodiment of the present invention will include clip connectors that extend at least one third the length of the respective side panel. It is contemplated that the clip connectors do not extend completely along the length of the side panels because this makes the air bag cover difficult to remove from the mold in the manufacturing process.

6

While only certain embodiments of the method and apparatus of the present invention have been shown and described, others may be possible without departing from the scope of the following claims.

What is claimed is:

1. A plastic molded, snap-on air bag cover mountable onto an air bag container including a retaining member, said snap-on air bag cover comprising:
 - a front cover adapted to overlie an uninflated air bag container;
 - first and second side panels connected to opposite sides of said front cover;
 - a resilient clip member extending from each of said side panels, each said clip member having an extending snap-on groove defined therein adapted to cooperate with said retaining member for affixing said air bag cover to said air bag container, each clip member characterized in cross section as having an engagement section for contacting the retaining member during mounting onto the container and a biasing groove formed therein to facilitate resilient displacement of the engagement section and wherein at least one clip member is attached to its respective side panel in a live hinge-like fashion to assist in a snap-on mounting of the cover onto the container.
2. A snap-on air bag cover as in claim 1 wherein said each clip member comprises a front engagement section and a rear shoulder section, said front engagement section having an inclined outer surface for cooperating with said retaining member for sliding said air bag cover onto said air bag container, and the respective snap-on groove is disposed between said front and rear sections.
3. A snap-on air bag cover as in claim 2 wherein said front engagement section includes a plurality of spaced, parallel supports disposed perpendicular to the respective snap-on groove.
4. A snap-on air bag cover as in claim 1 wherein each said snap-on groove is "L" shaped in cross section.
5. A snap-on air bag cover as in claim 1 wherein each said clip member extends along at least one third the length of each said side panel and each said snap-on groove extends the entire length of each said clip member.
6. A snap-on air bag cover as in claim 1 wherein said side panels are hingedly connected to said front cover for allowing said side panels to move in relation to said front cover.
7. A snap-on air bag cover as in claim 1 molded from a resilient thermoplastic material.
8. A snap-on air bag cover as in claim 7 wherein said thermoplastic material is a thermoplastic rubber.
9. A snap-on air bag cover as in claim 7 wherein said material has a tensile strength in a range from 15.0 to 17.0 Mpa and a tear strength in a range from 47 to 51 kN/M at 25 degrees celsius and 21 to 25 kN/m at 100 degrees celsius.
10. An air bag cover as in claim 7 wherein said material has a durometer hardness ranging from 70 to 100 on the Shore A scale.
11. An improved air bag cover of the type adapted to snap onto the retaining rim of an air bag container, the cover comprising a homogenous thermoplastic molded body including a separable front cover panel from which project toward the container a plurality of transverse panels, each of the transverse panels being flexural relative to the front panel, the improvement characterized in that:
 - a plurality of the transverse panels are formed with a connector for a snap-on engagement with the container rim, each connector comprising,
 - a snap-on groove extending along a segment of the transverse panel, the groove having a cross-section

7

shape adapted to receive and engage the container rim, and

an engagement member positioned ahead of the snap-on groove for guiding the container rim into engagement with the snap-on groove during flexural displacement of the traverse panel.

12. The air bag cover of claim 11, wherein the engagement member is co-extensive with the groove.

13. The air bag cover of claim 11, wherein the engagement member is resiliently displaceable in response to relative movement of the rim toward engagement with the groove.

14. The air bag cover of claim 13, wherein the engagement member is divided into first and second spaced sections which are resiliently displaceable relative to one another to assist guidance of the container rim into engagement with the groove.

15. The air bag cover of claim 11, wherein the engagement member is formed with an inclined surface for contacting the container rim to guide the rim into engagement with the snap-on groove.

8

16. The air bag cover of claim 15, wherein the inclined surface is provided structural support by a plurality of spaced supports disposed perpendicularly to the groove and internally of the inclined surface.

17. The air bag cover of claim 11, wherein the connector further comprises an array of spaced, parallel supports joining the engagement member to the associated transverse wall for structural support.

18. The air bag cover of claim 17, wherein the supports are disposed perpendicularly to the groove.

19. The air bag cover of claim 11, wherein the connectors are formed on at least one pair of oppositely disposed transverse panels.

20. The air bag cover of claim 11, wherein the connectors are formed on first and second pairs of oppositely disposed transverse panels.

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EXHIBIT B

United States Patent
Eckhout
Patent Number: 5,498,026
Date of Patent: Mar. 12, 1996

[54] AIR BAG COVER HAVING A HIDDEN
BREAK SEAM
[75] Inventor: Thomas L. Eckhout, Waterford, Mich.
[73] Assignee: Larry J. Winget, Leonard, Mich.

[21] Appl. No.: 410,559
[22] Filed: Mar. 24, 1995

Related U.S. Application Data

[63] Continuation of Ser. No. 140,768, Oct. 20, 1993, abandoned,
which is a continuation-in-part of Ser. No. 984,326, Dec. 2,
1992, abandoned.

[51] Int. Cl.⁸ B60R 21/20
[52] U.S. Cl. 280/728.3
[58] Field of Search 280/728 B, 731,
280/732, 728 A, 728.3

[56] References Cited

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Primary Examiner—Margaret A. Focarino
Assistant Examiner—Peter C. English

[57] ABSTRACT

A plastic air bag cover for use in an automobile, the air bag cover comprising, a front cover adapted to enclose an uninflated automotive air bag, the front cover having inner and outer surfaces defining a first thickness therebetween and a decorative indicia defined on the outer surface of the front cover and a break seam defined in the inner surface of the front cover for permitting the air bag to inflate and exit the front cover, the break seam further defining a break pattern and having a first wall, a second wall and a break wall connecting the first and second walls, the break wall having inner and outer surfaces defining a second thickness therebetween, wherein the second thickness is less than the first thickness, the break wall and first and second walls are visually imperceptible when viewing the front cover outer surface, and the break seam is substantially non-coincident with the decorative indicia.

16 Claims, 2 Drawing Sheets

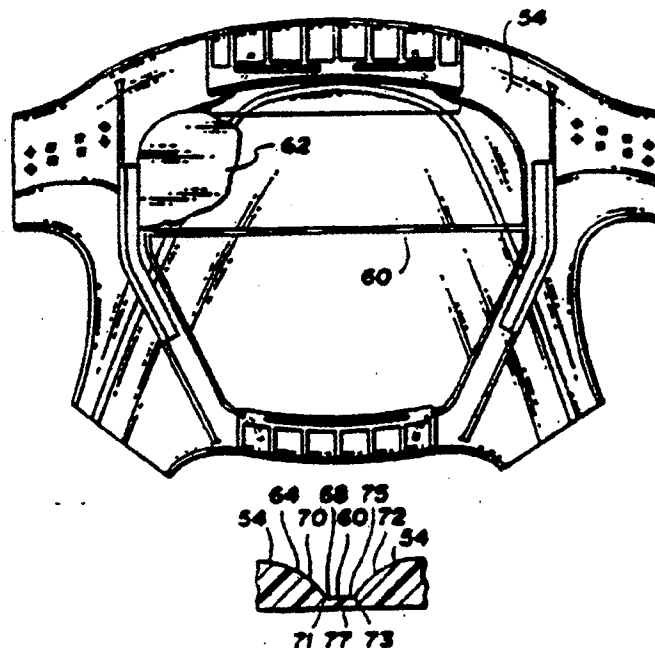


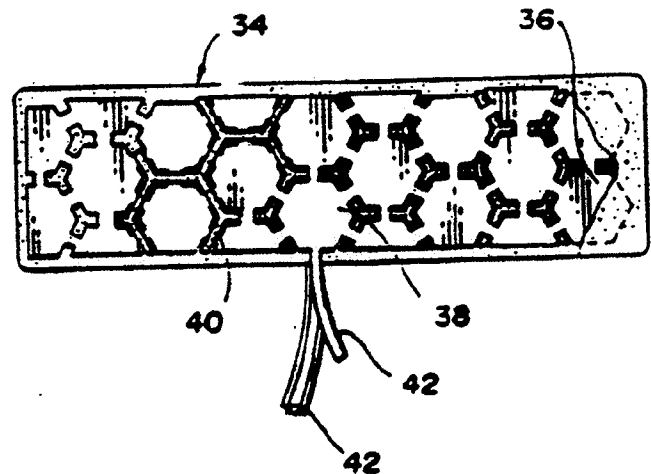
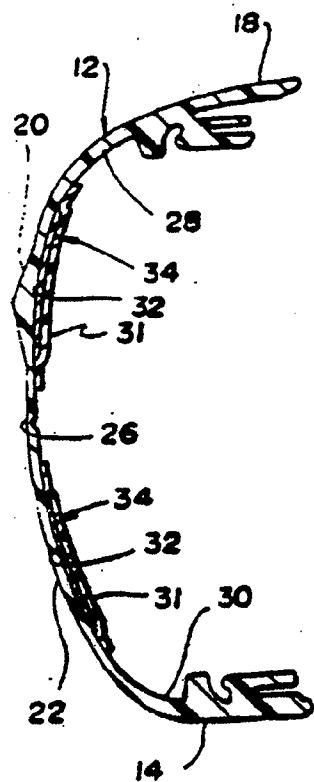
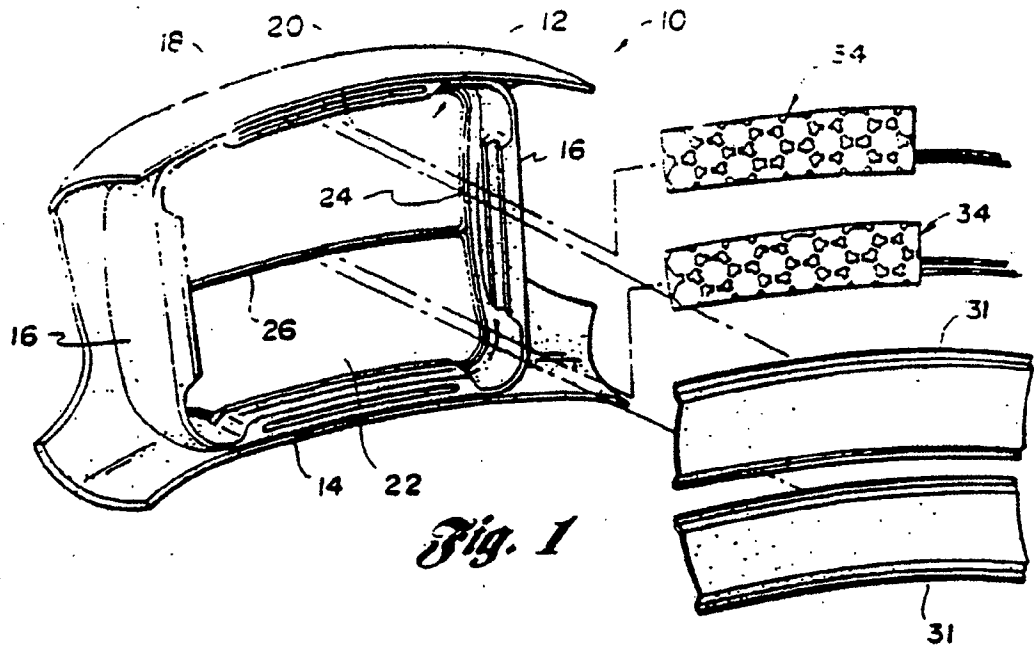
Exhibit B

U.S. Patent

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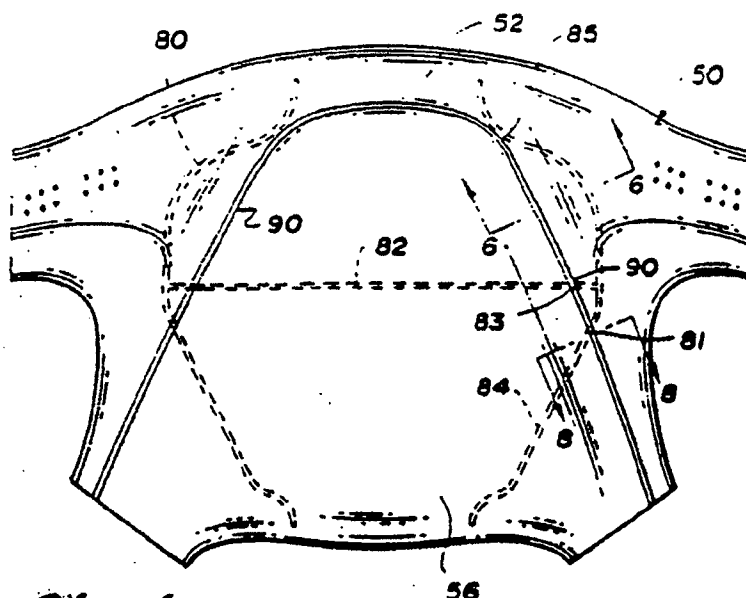


Fig. 4

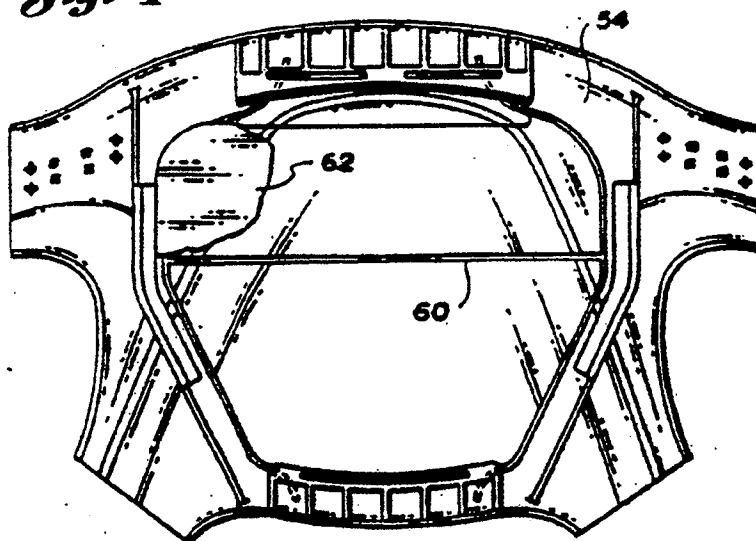


Fig. 5

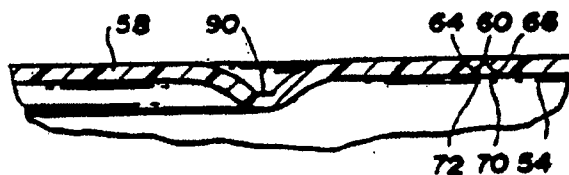


Fig. 6

Fig. 7

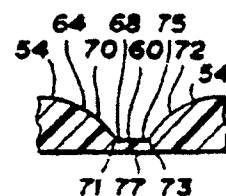
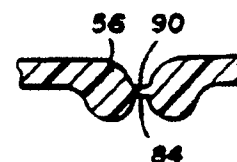


Fig. 8



5,498,026

AIR BAG COVER HAVING A HIDDEN BREAK SEAM

This is a continuation of application Ser. No. 08/140,768, filed Oct. 20, 1993, abandoned, which is a continuation-in-part of application Ser. No. 07/984,326, filed Dec. 2, 1992, abandoned.

TECHNICAL FIELD

This invention relates to plastic air bag covers and in particular to air bag covers having hidden break seams.

BACKGROUND ART

Presently, when air bag covers are provided in automobiles on the driver side of the vehicle, the air bag is stored in the steering column behind an air bag cover. During automatic inflation of the air bag, the air bag cover moves away from the steering column to permit its safety function between the steering column and the operator of the vehicle.

Recent practice in the automotive industry is utilization of all plastic fabricated air bag covers. Conventional air bag covers used in conjunction with occupant restraint systems often include noticeable or visually perceptible break seams or scores disposed on the exterior surface of the air bag cover. The break seams or scores represent selected weakened surfaces where the inflating air bag initially separates or breaks through the air bag cover and moves away from the steering wheel to perform its safety feature.

U.S. Pat. No. 4,325,568 issued to Clark et al. discloses a modular occupant restraint system including an inflator, a cushion, a container for the cushion and an air bag cover for the container assembled as a module. Clark et al. further discloses use of score lines that are visually perceptible from a front view of the air bag cover as it is operably mounted on the steering wheel of the automobile.

U.S. Pat. No. 5,085,462 issued to Gaultier discloses an air bag and vehicle horn switch assembly. The assembly of Gaultier also discloses use of an air bag cover including visually perceptible exterior break seams or score lines in the operable mounted position within the vehicle.

U.S. Pat. No. 5,186,490 issued to Adams et al. discloses a cover for an inflatable restraint system for a motor vehicle which contains a slot in the upper wall thereof into which a thin or membrane type switch assembly is inserted. Adams et al. further discloses an air bag cover having an injection molded thermoplastic upper wall and a soft outer cover exposed to the interior of the vehicle manufactured from urethane, vinyl or polyester. The outer cover completely encompasses and overlaps the upper wall structure and uninflated air bag forming two structures the air bag must exit to carry out its function.

Current trends in the automotive manufacturing industry are oriented towards providing, clean aesthetically pleasing outer surfaces within the interior of the automobile. Inclusion of extraneous exterior break seams or score lines that are perceptible from an occupant's viewpoint in front of the steering wheel detracts from the overall appearance of the interior of the automobile.

It is also known that the provision of noticeable exterior break seams or score lines that are designed for aesthetic purposes is very difficult to achieve as the final design obtained must satisfy engineering requirements related to inflation and exit of the air bag. Thus, use of visually noticeable exterior outer score lines is limited to known

score and designs such as the "H" shaped score disclosed in U.S. Pat. No. 5,085,462 to Gaultier.

DISCLOSURE OF THE INVENTION

An object of the present invention is to provide an automotive air bag cover having a break seam for allowing inflation and exit of the air bag from the air bag cover which is visually imperceptible from the outer exposed front surface of the air bag cover.

In carrying out the above objects and other objects of the present invention, an automotive air bag cover constructed in accordance with the present invention is provided. The air bag cover includes a decorative front cover adapted to enclose an uninflated automotive air bag. The front cover has inner and outer surfaces that define a first thickness therebetween. A break seam is further defined in the front cover inner surface for permitting the air bag to inflate and exit the front cover. The break seam includes a first wall, a second wall and a break wall defined therebetween having a second thickness that is less than the first thickness. The break seam provided in accordance with the present invention is visually imperceptible when viewing the exposed front cover outer surface.

Preferably, the break seam first and second walls are annular in shape and the break wall is substantially planar in relation to said first and second annular walls.

Also, preferably, the first and second annular walls are disposed in a convex facing relationship with respect to the break surface.

These and other features and additional objects of the invention will occur to those skilled in the art on reading the following description with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded view of an automotive air bag cover, constructed in accordance with the present invention;

FIG. 2 is a sectional view of the assembled air bag cover of FIG. 1;

FIG. 3 is a top plan view, partially broken away, of the horn switch assembly.

FIG. 4 is a front elevational view of an alternative embodiment of an automotive air bag cover constructed in accordance of the present invention;

FIG. 5 is a rear elevational view of the alternative embodiment of FIG. 4;

FIG. 6 is a cross sectional view of the air bag cover of the present invention taken along lines 6-6 of FIG. 4;

FIG. 7 is an enlarged view of a break seam constructed in accordance with the present invention;

FIG. 8 is an enlarged cross section taken along lines 8-8 of FIG. 4.

BEST MODE FOR CARRYING OUT THE INVENTION

Referring now to the drawing FIGURES, there is illustrated in FIGS. 1 and 2, a first embodiment of an automotive air bag cover, generally indicated at 10, constructed in accordance with the present invention. Typically, the automotive air bag cover 10 is secured at the top end of a vehicle drive column (not shown) at the steering wheel of the vehicle.

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3
A front cover, generally indicated at 12 of the air bag cover 10, is integrally formed with side panels 14, 16 and 18. Typically, the side panels 14, 16 and 18 are apertured, as illustrated in FIGS. 1 and 2, to permit the cover 10 to be fixedly secured to the vehicle drive column. An outer surface (not shown) is disposed to face the vehicle operator.

The front and side panels 12, 14, 16, and 18 are adapted to enclose an uninflated automotive air bag (not shown) between the cover 10 and the steering column (not shown).

The front panel 12 includes upper and lower portions 20 and 22, respectively. The upper and lower portions 20 and 22 are interconnected to the side panels 16 at break seams 24 (only one of which is shown in FIG. 1) and to each other at a break seam 26. The break seams 24 and 26 are of reduced thickness, to permit the air bag, as it is inflating, to exert a force at the inner portion of the front panel 12 to cause the upper and lower portions 20 and 22 of the front panel 12 to separate from the side panels 16 along the break seams 24 and to separate from each other along the break seam 26.

The upper portion 20 of the front panel 12 is hingedly connected to the top panel 18 at a hinge 28 and the lower portion 22 of the front panel 12 is hingedly connected to the bottom side panel 14 at a hinge 30, as best shown in FIG. 2. After separation from the side panels 16, the upper and lower portions 20 and 22 of the front panel 12 can swing upwardly and downwardly, respectively, and out of the way of the inflating air bag.

Rear panels 31 are fixedly secured about their periphery to the upper and lower portions 20 and 22 of the front panel 12 at their inner surfaces to move therewith and to form sealed, hollow compartments 32, as best shown in FIG. 2. Preferably, the rear panels 31 are hot plate welded, heat staked or otherwise attached to the upper and lower portions 20 and 22 at their outer periphery adjacent the break seam 26 between the upper and lower portions 20 and 22, respectively, and adjacent the break seams 24. The rear panels 31 do not cover any of the break seams 24 or 26 since this would hinder or possibly prevent separation along the break seams 24 and 26.

The air bag cover 10 preferably includes a pair of horn switch assemblies, generally indicated at 34. Each assembly 34 extends substantially the entire width of the front panel 12 between the side panels 16 within its respective hollow compartment 32.

As illustrated in FIG. 2, each assembly 34 substantially fills its respective hollow compartment 32. As illustrated in FIG. 3, each horn switch assembly 34 includes a pair of spaced flexible, transparent, plastic layers 36. On the inner surface of one of the plastic layers 36, there is formed a matrix layer 38 of interconnected hexagonal pads which forms an electrically conductive inner surface for making a circuit path with a corresponding second electrically conductive inner surface of another matrix of interconnected hexagonal pads formed on the other plastic layer 36. Upon manual actuation of the corresponding portion of the front panel 12, the circuit path is made.

The circuit path is made through an insulator layer 40 which is disposed between and spaces the layers 38 apart so that electrical connection is only made between the hexagonal pads of the layers 38. The insulator layer 40 insulates the interconnecting portions of the electrically conductive inner surfaces of the layers 38 from one another. The insulator layer 40 is preferably made of foam and has a honeycomb structure.

Preferably, the horn switch assemblies 34 are foil switch assemblies cut to size from a mat of material commercially

4
available from Illinois Tool Works, Inc. of Glenview, Ill. Then, electrically conductive leads 42 which are encapsulated in plastic are electrically connected to certain pads of each of the layers 38 at one end thereof and to the automobile's electrical system at the opposite end through a break-away connection.

Referring now to FIGS. 4 and 5, there is shown generally, air bag cover 50, an alternative embodiment constructed in accordance with the present invention. The air bag cover 50 includes a front cover 52 having an inner surface 54 and an outer surface 56. As shown in FIG. 6, the inner and outer surfaces 54 and 56 respectively define the thickness 58 of front cover 52 which is in a range from 2.0 to 6.0 millimeters. The preferred thickness is 4.0 millimeters. The air bag cover 50 is designed to be operably located within the automobile interior (not shown) such that the front cover outer surface 56 is exposed to occupant view.

A weakened area or break seam 60 is shown in FIGS. 4 and 5. The break seam 60 is, as discussed above, necessarily designed to allow inflation and exit of air bag 62 from the air bag cover 50 to permit its safety function between the steering column and operator (not shown). The break seam 60 is therefore designed to be the primary or sole, break area of the air bag cover during inflation and exit of the air bag 62.

Referring to FIG. 7, the break seam 60 includes, in the preferred embodiment, a first wall 64 and a second wall 66. A break wall 68 extends between the first wall 64 and the second wall 66, a distance of at least 0.3 millimeters. The first and second walls 64 and 66 are each convex in shape and are disposed in a symmetrical, facing relationship with respect to the break wall 68.

More specifically, the first wall has a convex portion 70 that extends from the inner surface 54 of the front cover 52 to the side 71 of the break wall 68. The convex portion 70 is defined in cross section by a curve having a radius in a range from 4.0 to 11.0 millimeters. The preferred range for the radius of the convex portion 70 is between 6.0 and 9.0 millimeters.

Similarly, the second wall 66 has a convex portion 72 that extends from the inner surface 54 of the front cover 52 to the side 73 of the break wall 68. The convex portion 72 is defined in cross section by a curve having a radius in a range from 4.0 to 11.0 millimeters. The preferred range for the radius of the convex portion 72 is between 6.0 and 9.0 millimeters. Additionally, the break wall 68 has an inner surface 75 and an outer surface 77 defining a uniform thickness in a range from 0.2 to 0.9 millimeters, with the preferred thickness being 0.5 millimeters.

Both embodiments of the present invention, air bag cover 10 illustrated in FIG. 1 and air bag cover 50 illustrated in FIG. 5 include a break seam which is visually imperceptible from the exposed outer surfaces of their respective front covers, 12 and 52 respectively. As shown in FIGS. 4, 6 and 7, the break seam constructed in accordance with the present invention provides an outer surface 56 of the front cover which is undisturbed by the inclusion of annular walls 70 and 72, and break wall 68. From the exterior, exposed side of the air bag cover outer surface 56, break seam 60 is visually imperceptible as shown by phantom lines 80, 82 and 84 in FIG. 4.

The air bag cover of the present invention therefore provides a cover which does not require any additional parts or cover-up decorating pieces to afford a clean, aesthetically pleasing outer surface. The common, visually noticeable "U" or "H" shaped designs of the prior art are avoided with

the present invention. As such, entirely aesthetic front cover designs can be provided on air bag covers which are unrelated and unaffected by the presence of the break seam 60.

For example, in FIGS. 4 and 8, the air bag cover 50 includes a decorative indicia or contour line 90. Contour line 90 is an extending groove which is molded into the air bag cover in the manufacturing process. Conventional air bag covers include different kinds of indicia including grooves, extending ribs and decorative appliques. Contour line 90 is substantially non-coincident with the hidden break seam lines 80, 82 and 84. As shown in FIG. 4, the contour line 90 intersects with the break seams at points 81, 83, and 85 but does not form any substantial part of the break seam. Similarly, the break seams 80, 82 and 84 do not form any part of the contour line on outer surface 56. The visual aspects of the contour line 90 are completely unaffected by the break seams 80, 82 and 84.

It is preferred that the air bag cover of the present invention be manufactured from a flexible thermoplastic rubber such as commercially available "Santoprene" 201-87 provided by Advance Elastomers Systems of Auburn Hills, Mich. Santoprene is a registered trademark of the Monsanto Company. Santoprene 201-87 is a colorable thermoplastic general purpose elastomer with good fluid resistance which is processable by injection molding and extrusion. In addition, the thickness of the break wall is dependent upon the force exertable on the air bag cover by the inflating air bag.

The tear strength, ultimate tensile strength, hardness, and elasticity of the material are characteristics important to the choice of thermoplastic material used to manufacture the air bag. The preferred thermoplastic material used for manufacture of the air bag cover has a tensile strength in a range from 15.0 to 17.0 Mpa's and more preferably 15.5 to 16.5 Mpa's. The preferred material used has a tear strength in a range from 47 to 51 kN/m at 25 degrees celsius and 21 to 25 kN/m at 100 degrees celsius. The preferred material used has a durometer hardness in a range of 70 to 100 on the Shore A scale, and more preferably in a range of 85 to 90. The above characteristics in conjunction with the structure of the air bag cover satisfy the necessary conditions related to the inflation and exit of the air bag from the cover.

While only certain embodiments of the method and apparatus of the present invention have been shown and described, others may be possible without departing from the scope of the following claims.

I claim:

1. (Amended) A homogeneous thermoplastic air bag cover for use in an automobile, said air bag cover comprising:

a front cover adapted to enclose an uninflated automotive air bag, the front cover having inner and outer surfaces defining a first thickness therebetween; and

a break seam defined in said inner surface of said front cover for permitting the air bag to inflate and exit the front cover, said break seam further defining a break pattern and having a first convex wall, a second convex wall and a substantially planar break wall connecting said first and second walls and having a width of at least 0.3 millimeters, said break wall having inner and outer surfaces defining a second thickness therebetween, wherein said second thickness is less than said first thickness, said break pattern being visually imperceptible when viewing from the front cover outer surface.

2. An air bag cover as in claim 1 wherein said first and second walls are disposed in a facing relationship with respect to said break wall inner surface.

3. An air bag cover as in claim 1 wherein said first and second walls are substantially symmetrical about said break wall.

4. An air bag cover as in claim 1 wherein said break seam has a uniform thickness.

5. An air bag cover as in claim 1 wherein said first thickness is in a range from 2.0 to 6.0 millimeters and said second thickness is in a range from 0.2 to 0.9 millimeters.

6. An air bag cover as in claim 1 wherein each of the first and second walls is characterized in cross section by a curved surface having a central radius in a range from 4.0 to 11.0 millimeters.

7. An air bag cover as in claim 1 wherein each of the first and second walls is characterized in cross section by a curved surface having a central radius in a range from 6.0 to 9.0 millimeters.

8. An air bag cover as in claim 1 wherein the plastic is a thermoplastic rubber.

9. An air bag cover as in claim 1 wherein said front cover is formed of a material having a tensile strength in a range from 15.0 to 17.0 MPa.

10. An air bag cover as in claim 1 wherein said front cover is formed of a material having a tensile strength in a range from 15.5 to 16.5 Mpa.

11. An air bag cover as in claim 1 wherein said front cover is formed of a material having a tear strength in a range from 47 to 51 kN/m at 25 degrees celsius and 21 to 25 kN/m at 100 degrees celsius.

12. An air bag cover as in claim 1 wherein said front cover is formed of a material having a tear strength of approximately 49 kN/m at 25 degrees celsius and 23 kN/m at 100 degrees celsius.

13. An air bag cover as in claim 1 wherein said front cover is formed of a material having a durometer hardness ranging from 70 to 100 on the Shore A scale.

14. An air bag cover as in claim 1 wherein said front cover is formed of a material having a durometer hardness ranging from 85 to 90 on the Shore A scale.

15. An air bag cover as in claim 1 wherein said break seam is integrally formed in said inner surface.

16. A homogeneous thermoplastic air bag cover for use in an automobile, said air bag cover comprising:

a thermoplastic rubber front cover adapted to enclose an uninflated automotive air bag, the front cover having inner and outer surfaces defining a first thickness therebetween, and a decorative indicia defined on the outer surface of said front cover, said front cover inner surface adapted to abuttingly engage said uninflated air bag; and

a break seam defined in said inner surface of said front cover for permitting the air bag to inflate and exit the front cover, said break seam having a first wall defined in cross section by a first curve having a radius in a range from 4.0 to 11.0 millimeters, a second wall defined in cross section by a second curve having a radius in a range from 4.0 to 11.0 millimeters and a substantially planar break wall connecting said first and second walls and having a width of at least 0.3 millimeters, said break wall being linear in cross section in relation to said first and second walls, said break wall having inner and outer surfaces defining a second thickness therebetween, said second thickness in a range from 0.4 to 0.75 millimeters and wherein the break seam provides an outer surface of the front cover which is undisturbed by the inclusion of the first and second walls and the break wall.

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

THOMAS L. ECKHOUT

U.S.P.N. 5,498,026

Issued: March 12, 1996

AIR BAG COVER HAVING A HIDDEN
BREAK SEAM

"MAKE OF RECORD" LETTER

Commissioner of Patents
and Trademarks
Washington, D.C. 20231

Dear Sir:

The following errors have been found in the original
Letters Patent:

Column 6, line 4, claim 4 (old claim 7, page 14, line
9), delete ",," and insert therefor --.--; and

Column 6, line 23, claim 10 (old claim 13, page 3, line
16 of Amendment of November 9, 1994) delete "Mpa" and insert
therefor --MPa--.

It is hereby respectfully requested that the foregoing
errors be made of record in the file of the subject patent.

Respectfully submitted,

BROOKS & KUSHMAN P.C.



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Dated: April 24, 1996

EXHIBIT C

United States Patent [19] [11] = Patent Number: **Re. 35,031**
Winget [43] Reissued Date of Patent: **Sep. 5, 1995**

[54] **AUTOMOTIVE AIR BAG COVER HAVING A HORN SWITCH FORMED THEREIN**

[76] Inventor: **Larry J. Winget**, 1799 Foxknoll, Leonard, Mich. 48038

[21] Appl. No.: **136,324**

[22] Filed: **Oct. 13, 1993**

Related U.S. Patent Documents

Reissue of:

[64] Patent No.: **5,062,661**
Issued: **Nov. 5, 1991**
Appl. No.: **555,893**
Filed: **Jul. 20, 1990**

[51] Int. Cl.⁶ **B60R 21/08**
[52] U.S. Cl. **280/731; 280/734**
[58] Field of Search **280/728 B, 731, 743 R, 280/734**

[56] **References Cited**

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5,085,462 2/1992 Gualtier **280/731**
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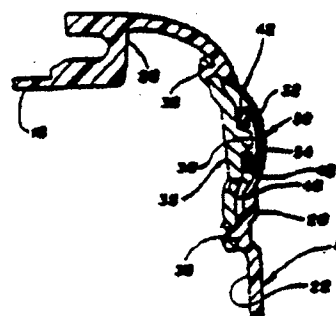
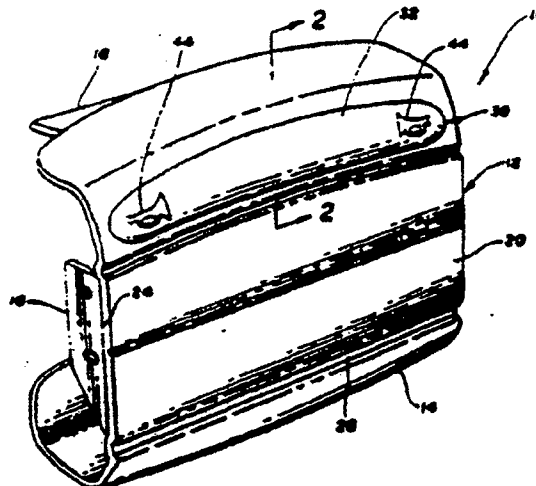
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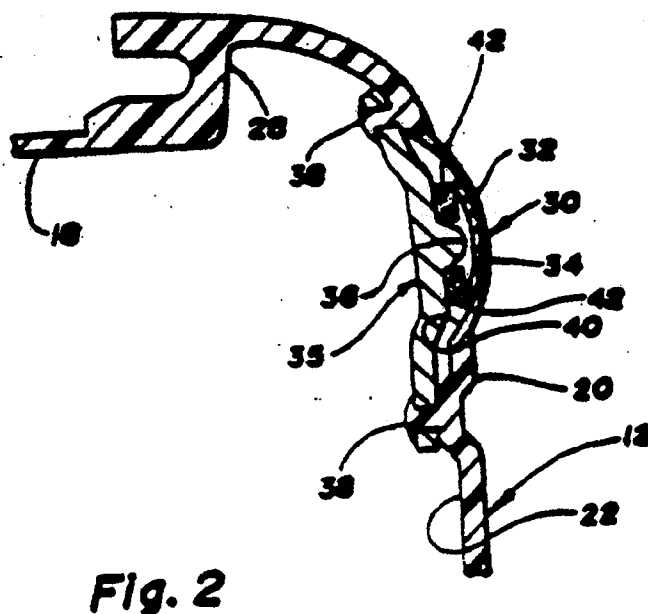
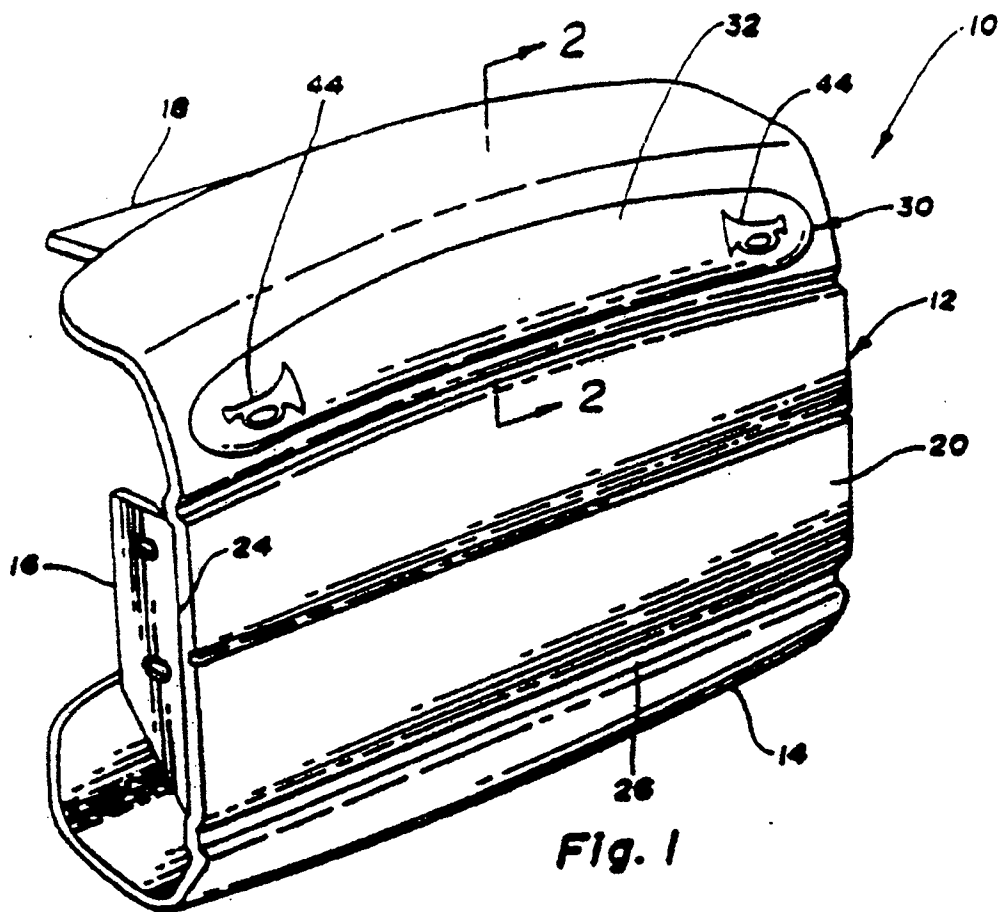
Primary Examiner—Kenneth R. Rice
Attorney, Agent, or Firm—David R. Syrowik

[57] **ABSTRACT**

An automotive air bag cover including a horn switch device incorporated therein, is provided. The air bag cover includes substantially rigid front and side panels which are adapted to enclose an uninflated automotive air bag. The front panel has inner and outer surfaces and is connected to the side panels at seams to permit the inflating air bag to leave the cover as the inflating air bag exerts a force at the inner surface of the front panel sufficient to cause the front panel to separate from the side panels along the seams. The horn switch device includes a flexible, manually operable diaphragm at the outer surface of the front panel. The diaphragm has a first electrically conductive inner surface for making a circuit with a corresponding second electrically conductive inner surface of the front panel upon manual actuation of the diaphragm.

11 Claims, 1 Drawing Sheet





Re. 35.031

1

AUTOMOTIVE AIR BAG COVER HAVING A HORN SWITCH FORMED THEREIN

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

TECHNICAL FIELD

This invention relates to air bag covers and, in particular, to air bag covers having a horn switch incorporated therein.

BACKGROUND ART

Presently, when air bags are provided in automotive vehicles the air bag is stored in the steering column of the vehicle behind an air bag cover. During automatic inflation of the air bag, the air bag cover moves away from the steering column to permit the air bag to perform its safety function between the steering column and the operator of the vehicle.

Any manually operable horn switch or switches are typically also located on the steering wheel column on opposite sides of the air bag cover. However, these switches typically are rather small and oftentimes inaccessible for drivers who have large hands or for drivers who have limited manual dexterity.

SUMMARY OF THE INVENTION

An object of the present invention is to provide an automotive air bag cover having a horn switch device incorporated therein.

In carrying out the above objects and other objects of the present invention, an automotive air bag cover constructed in accordance with the present invention is provided. The air bag cover includes substantially rigid front and side panels adapted to enclose an uninflated automotive air bag. The front panel has inner and outer surfaces. The front panel is interconnected to the side panels at seams which permit the inflated air bag to leave the cover wherein the inflating air bag exerts a force at the inner surface of the front panel sufficient to cause the front panel to separate from the side panels along the seams. The air bag cover further includes a horn switch device, including a flexible manually-operable diaphragm at the outer surface of the front panel. The diaphragm has a first electrically conductive inner surface for making a circuit path with the corresponding second electrically conductive inner surface of the front panel upon manual actuation of the diaphragm.

Preferably, the diaphragm is integrally formed with the front panel.

Also, preferably, the second electrically conductive inner surface is defined by a rigid plate connected to remainder of the front panel.

The automatic air bag cover constructed in accordance with the above invention provides numerous advantages. For example, the horn switch device is easily accessible on the outer surface cover. Furthermore, such a switch device can be relatively inexpensively incorporated in a conventional air bag cover, thereby freeing up additional areas on the steering column.

The objects, features and advantages of the present invention are readily apparent from the following detailed description of the best mode for carrying out the

2

invention when taken in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates an automotive air bag cover, constructed in accordance with the present invention; and FIG. 2 is a sectional view, taken along lines 2-2 of FIG. 1, illustrating the horn switch device of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

Referring now to the drawing figures, there is illustrated in FIG. 1 an automotive air bag cover, generally indicated at 10, constructed in accordance with the present invention. Typically, the automotive air bag cover 10 is secured at the top end of a vehicle drive column at the steering wheel of the vehicle.

A substantially rigid front panel, generally indicated at 12 of the cover 10, is integrally formed with side panels 14, 16 and 18 (only one of the side panels 16 is shown). Typically, the side panels 14, 16 and 18 are apertured, as illustrated in FIG. 1, to permit the cover 10 to be fixedly secured to the vehicle steering column.

The front and side panels 12, 14, 16, and 18 are adapted to enclose an uninflated automotive air bag between the cover 10 and the steering column.

The front pane 12 is interconnected to the side panels 16 and 14 at seams 24 and 26, which are of reduced thickness, to permit the air bag as it is inflating, to exert a force at the inner surface 22 of the front panel to cause the front panel 12 to separate from the side panels 14 and 16 along the seams 24 and 26.

The front pane 12 is hingedly connected to the top panel 18 at a hinge 28, as best shown in FIG. 2 so that after separation from the side panels 14 and 16, the front panel 12 can swing upwardly and out of the way of the inflating air bag.

The air bag cover 10 includes a horn switch device, generally indicated at 30, which extends substantially the entire width of the front panel 12 between the side panels 16. The horn switch device 30 includes a flexible manually operable diaphragm 32 preferably integrally formed with the rest of the front panel 12 and the side panels 14, 16 and 18 from plastic (preferably TPO). The diaphragm 32 has a convex shape at the outer surface 20 of the front panel 12.

The diaphragm 32 has at its inner surface thereof, a strip of electrically conductive aluminum tape 34 which forms a first electrically conductive inner surface for making a circuit path with a corresponding second electrically conductive inner surface 35 of a substantially rigid plate, generally indicated at 36. The plate 36 may comprise a molded switch with a molded in connector which is heat-staked or otherwise attached to the plastic portion of the front panel 12 at a plurality of locations 38. Alternately, the plate 36 may be made of an electrically conductive metal.

Alternately, the electrically conductive aluminum tape 34 may be replaced by a conductive thermoplastic with a molded-in connector, which, when the diaphragm 32 is manually actuated, electrically engages or is electrically connected to the inner surface 35 of the molded plate 36.

The plate 36, the diaphragm 32 and the electrically conductive aluminum tape 34 define a hollow compartment 40 within the front panel 30. A pair of spaced

Re. 35.031

3
elongated foam-insulators 42 are disposed between the plate 36 and the conductive tape 34 so that the electrical connection is only made at the top of the electrically conductive surface 37 between the insulators 42.

Referring again to FIG. 1, preferably indicia 44 are formed on the outer surface of the diaphragm 32 to indicate the function of the switch horn device 30.

The advantages accruing to an automotive air bag cover 10 constructed as described above are numerous. For example, the function provided by the switch horn device 30 can be accomplished relatively inexpensively and can provide a relatively large surface area for manual operation. Also, the air bag cover 10 with the horn switch device 30 formed therein, frees up additional space on the vehicle steering column.

While a preferred embodiment of the subject invention has been shown and described in detail, those skilled in this art will recognize various alternative designs and embodiments for practicing the present invention as defined by the following claims.

What is claimed is:

1. An automotive air bag cover comprising:

substantially rigid front cover and side panels adapted to enclose an uninflated automotive air bag, the front panel having inner and outer surfaces and being interconnected to the side panel at seams which permit the inflating air bag to leave the cover, the inflating air bag exerting a force at the inner surface of the front panel sufficient to cause the front panel to separate from the side panels along the seams; and

a horn switch device including a flexible manually operable diaphragm at the outer surface of the front panel, the diaphragm having a first electrically conductive inner surface for making a circuit path with a corresponding second electrically conductive inner surface upon manual actuation of the diaphragm, the second electrically conductive inner surface being defined by a rigid plate attached to the substantially rigid remainder of the front panel to move therewith wherein the first and second electrically conductive inner surfaces define a hollow compartment in the front panel and wherein upon separation from the side panels the front panel including the diaphragm, the hollow compartment and the rigid plate move together to permit the inflating air bag to leave the cover.

2. The air bag cover as claimed in claim 1 wherein the diaphragm is integrally formed with the front panel.

3. The air bag cover as claimed in claim 1 wherein the front panel is hingedly connected to one of the side panels to allow the front panel to swing open during inflation of the air bag.

4. The air bag cover as claimed in claim 1 wherein the first electrically conductive inner surface is defined by an electrically conductive material.

5. The air bag cover as claimed in claim 1 further comprising at least one insulator disposed in the hollow compartment to insulate portions of the first and second electrically conductive inner surfaces from one another.

6. An automotive air bag cover comprising:

plastic front and side panels adapted to enclose an uninflated automotive air bag, the front panel having inner and outer surfaces and being interconnected to the side panels at seams which permit the inflating air bag to leave the cover;

a plate fixedly secured to the inner surface of the front panel to form a hollow compartment with the front panel; and

a switch device disposed in the hollow compartment and including a first electrically conductive surface for making a circuit path with a corresponding second electrically conductive surface upon manual actuation of a portion of the front panel at its outer surface thereof and wherein, upon separation from the side panels, the front panel including the hollow compartment, the switch device and the plate move together to permit the inflating bag to leave the cover, wherein the front panel includes a flexible diaphragm at the outer surface of the front panel for manual operation of the switch device.

7. The air bag cover as in claim 6 wherein the diaphragm is integrally formed with the front panel.

8. The air bag cover as in claim 6 wherein the front panel is hingedly connected to one of the side panels to allow the front panel to swing open during inflation of the air bag.

9. The air bag cover as in claim 6 further comprising at least one insulator disposed between the first and second electrically conductive inner surfaces.

10. The air bag cover as in claim 6 wherein the switch device is a horn switch device.

11. An automotive air bag cover comprising:

plastic front and side panels adapted to enclose an uninflated automotive air bag, the front panel having inner and outer surfaces and being interconnected to the side panels at seams which permit the inflating air bag to leave the cover;

a plate fixedly secured to the inner surface of the front panel to form a hollow compartment with the front panel; and

a switch device disposed in the hollow compartment and including a first electrically conductive surface for making a circuit path with a corresponding second electrically conductive surface upon manual actuation of a portion of the front plate at its outer surface thereof and wherein, upon separation from the side panels, the front panel including the hollow compartment, the switch device and the plate move together to permit the inflating bag to leave the cover, wherein the first electrically conductive surface is defined by the plate.

• • • • •

EXHIBIT D

KIRK AND ELLIS

PARTNERSHIPS INCLUDING PROFESSIONAL CORPORATIONS

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May 15, 2000

BY FACSIMILE AND REGULAR MAIL

John M. Halar, Esq.
Brooks & Kushman, P.C.
1000 Town Center, 22nd Floor
Southfield, MI 48075

Re: PHC v. General Motors Corporation

Dear John:

As you know, Rule 11 of the Federal Rules of Civil Procedure provides that signing a pleading is a representation by the attorney signing that:

to the best of the person's knowledge, information, and belief, formed after an inquiry reasonable under the circumstances, ... the claims ... therein are warranted by existing law or by a nonfrivolous argument for the extension, modification, or reversal of existing law ... [and that] the allegations and other factual contentions have evidentiary support

Fed. R. Civ. P. 11.

We are writing to provide you with advance notice that we, regrettably, are preparing a motion under Rule 11 seeking sanctions for the allegations in PHC's amended complaint that you and your client undeniably know are frivolous and without any conceivable evidentiary support.

For example, PHC's Amended Complaint accuses Delphi of infringing various patents by making, using, selling, and offering for sale air bag covers for the Catera, Malibu, Tracker, Esteem, Swift, Geo Metro, and Alero automobiles. However, as PHC either knows or should have known from a reasonable pre-filing investigation, Delphi does not make, use, sell, or offer for sale any of those airbag covers. Indeed, many of those covers are clearly marked with

John M. Halan, Esq.
May 15, 2000
Page 2

their true manufacturer's name. Suing Delphi over products it has nothing to do with is frivolous.

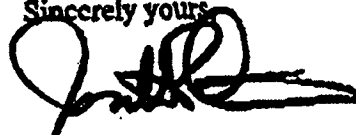
Likewise, the amended complaint asserts a claim for infringement of the '026 patent relating to the C/K truck airbag cover, among others. As we discussed extensively with you and your client before you filed the amended complaint, the claims of the '026 patent unambiguously require a "homogeneous thermoplastic" air bag cover with a "visually imperceptible" tear seam. However, Delphi's C/K truck airbag cover is made from two shots of two different materials, making it non-homogeneous. You *know* this to be true not only because we discussed it extensively with you, but also because we showed you Delphi's internal production drawings of the C/K truck airbag cover showing the two shots, and even lent you a C/K truck airbag cover sample with only a partial second shot that clearly showed both shots. PHC simply has no good faith basis for alleging infringement of the '026 patent.

Similarly, the only other airbag covers accused in the complaint that are made or sold by Delphi — the Park Avenue and Century covers — are also two shot, non-homogeneous covers.

Finally, Delphi has not made the Cutlass cover in years. Furthermore, that old Delphi cover could not conceivably infringe the '485 patent because it used rivets, and could not conceivably infringe the '026 patent because it had a visible tear seam.

Please let us know by Friday, May 19, 2000 whether PHC will be withdrawing its allegations of infringement under the '026 patent as well as its allegations regarding the Catera, Malibu, Tracker, Esteem, Swift, Geo Metro, Alero, and Cutlass airbag covers. Otherwise, we will have no choice but to serve and file our motion.

Sincerely yours



Jonathan Putnam

JFP:dmm

EXHIBIT E

BROOKS & KUSHMAN P.C.

Law Offices

Intellectual Property and Technology Related Causes

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David R. Syrowik
Mark A. Cantor
Ralph M. Burton
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May 7, 1998

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General Motors Corporation
Legal Staff
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P.O. Box 33114
Detroit, Michigan 48232

VIA OVERNIGHT COURIER

Re: Air Bag Cover Patents

Dear Ms. Marra:

This renews our correspondence ending with your letter of November 25, 1997. That letter concluded by a statement of your willingness "to address any specific concerns articulated by you related to specific products."

Your attention is invited to the Chevrolet air bag cover shown in the enclosed photographs. That cover: (i) is molded in thermoplastic, (ii) has a segmented snap-on attachment, (iii) has a hidden tear seam, and (iv) has an internal horn switch.

Please study the Chevrolet air bag cover relative to at least the following patent claims:

- * U.S. Patent No. 5,501,485 - Claim 11;
- * U.S. Patent No. 5,498,026 - Claims 1 and 16; and
- * U.S. Patent No. RE 35,031 - Claim 6.

Copies of these patents were provided in my earlier correspondence.

Please inform of a date and time during the week of May 11 when we may meet in person to discuss the matter. Mr. Darrius Priesler of Venture Industries Corporation and I request an opportunity to meet at your office to discuss this matter. We will bring the air bag cover shown in the enclosed photographs. We ask that you bring the engineering drawings for the cover, and have in attendance a knowledgeable technical person.

BK

1000 TOWN CENTER, TWENTY-SECOND FLOOR, SOUTHFIELD, MICHIGAN 48078
TELEPHONE (248) 358-4400, FACSIMILE (248) 368-3361

please acknowledge this letter and indicate an available meeting date and time during the week of May 11, as soon as possible. If you decline to meet, please let me know that, too, as soon as possible.

Very truly yours,

BROOKS & KUSHMAN P.C.



Robert C.J. Tuttle

RCJT/kg
Enclosures

cc: Mr. Darrius Priesler (w/enclosures)

BK